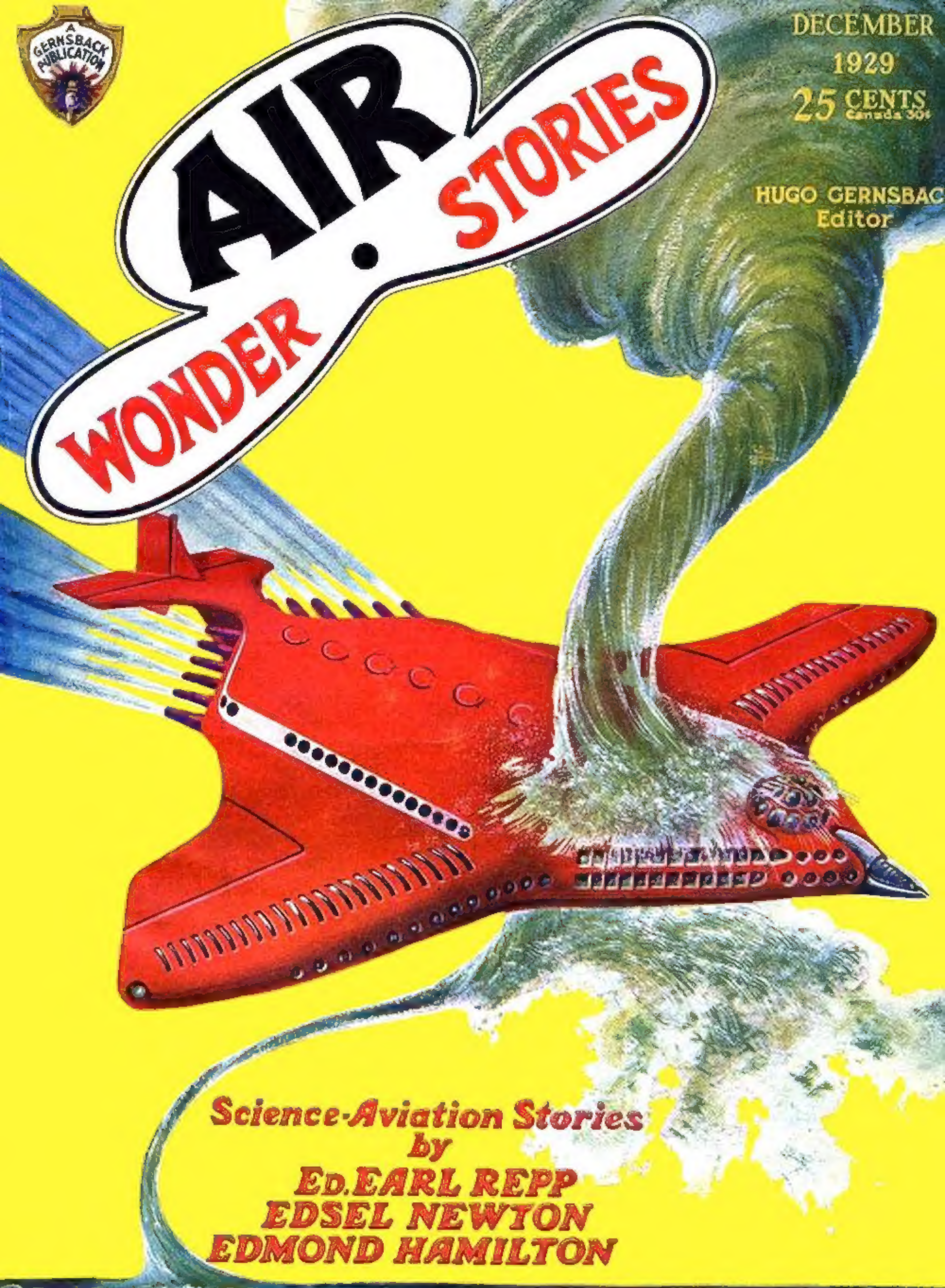
A GERNSBACK PUBLICATION

AIR WONDER STORIES

DECEMBER
1929
25 CENTS
Canada 30¢

HUGO GERNSBACK
Editor



Science-Aviation Stories
by
ED. EARL REPP
EDSEL NEWTON
EDMOND HAMILTON

PAUL

42 Miles on 1 Gallon of GAS

WILL YOUR CAR DO IT?

New Moisture Humidifier & Carbon Eliminator

for all Makes of Cars, Trucks, Tractors and Engines

An amazing Scientific Humidifier has been patented throughout the World that beats any ever got out. It makes engines run ALL THE TIME with the same wonderful efficiency they do on a cool moist night. It gives MORE pep and power, HIGHER top speed, eliminates hard carbon, and gives AMAZING mileage. Fords report 28 to 42 miles per gallon. Other makes (both American and Foreign) report marvelous increases of ¼ to double mileage. Some of the best records are:

	Miles		Miles		Miles		Miles
Buick	28¼	Essex	32	Nash	33	Pierce Arrow	22
Cadillac	21½	Ford (Model T)	42	Oakland	31	Pontiac	31
Chevrolet	41	Ford (Model A)	40	Oldsmobile	34½	Reo	26½
Chrysler	30¼	Hudson	23¼	Packard	21½	Studebaker	29
Dodge	31½	Hupmobile	24½	Plymouth	29	Whippet	41
Durant	41¾	Marmon	21½	Graham-Paige	23½	Willys-Knight	29

And Hundreds of Other Wonderful Records on ALL American and Foreign Makes

Big Profits

to

Man with Car

Spare or Full Time

$350 to $1500 a month

1 man $4,939.66 in 3½ months. Another $1,656.50 in 58 days. $5,150.00 in 5 months to another. BIG MONEY can be—IS being made.

Fitting Meters With Vix

One man sold 8 first morning Another sells all 3 men can install Another's profits as high as $100.0 a day.

VIX sells itself by 8 STARTLING demonstrations — BIG, STUNNING, ASTOUNDING DEMONSTRATIONS. Successful VIX men make MORE MONEY than they ever made before.

Free Trial Try This New Principle Gas Saver AT MY RISK

Try this wonderful VIX Moisture Humidifier and Carbon Eliminator AT MY RISK on YOUR OWN CAR to prove that VAPOR MOISTURE (drawn from Radiator to Engine) gives you that wonderful night driving effect ALL THE TIME with MORE mileage from gas and oil—eliminates hard carbon accumulation — gives MORE power, a SNAPPIER, PEPPIER motor, FASTER acceleration, a SMOOTHER, QUIETER running engine and HIGHER top speed.

VIX will PROVE ITS MONEY SAVING MERIT on your own car by 8 DEMONSTRATIONS—conducted by yourself AT MY RISK—the most SENSATIONAL, most ASTOUNDING, most CONVINCING DEMONSTRATIONS you ever saw. If you don't find from your tests that it does MORE than I claim, return it and it COSTS YOU NOTHING. **I want wide-awake, hustling, County, State, Province and National Agencies everywhere, part or full time, to make $360 to $1600 per month filling the great DEMAND for this wonderful invention wherever introduced. Write for my FREE TRIAL and MONEY MAKING OFFER. Use coupon below**

WALTER CRITCHLOW

Inventor and Manufacturer, 862-A Street, WHEATON,

Pictures here and at top show Model "B" VIX attached to my own New Model A Ford. This car is wonderfully improved in performance with the VIX Moisture Humidifier. So is every Auto, Truck, Tractor, Taxi, Bus, Marine, Stationary and Aircraft Engine, both American and all Foreign makes.

GUARANTEED TO SAVE

1/4 to 1/2 Gas
Carbon Cleaning
Engine Repairs

or Costs You Nothing

FREE VIX offer Mail No

WALTER CRITCHLOW
INVENTOR and MANUFACTURER
862-A Street, Wheaton, Ill., U. S. A.

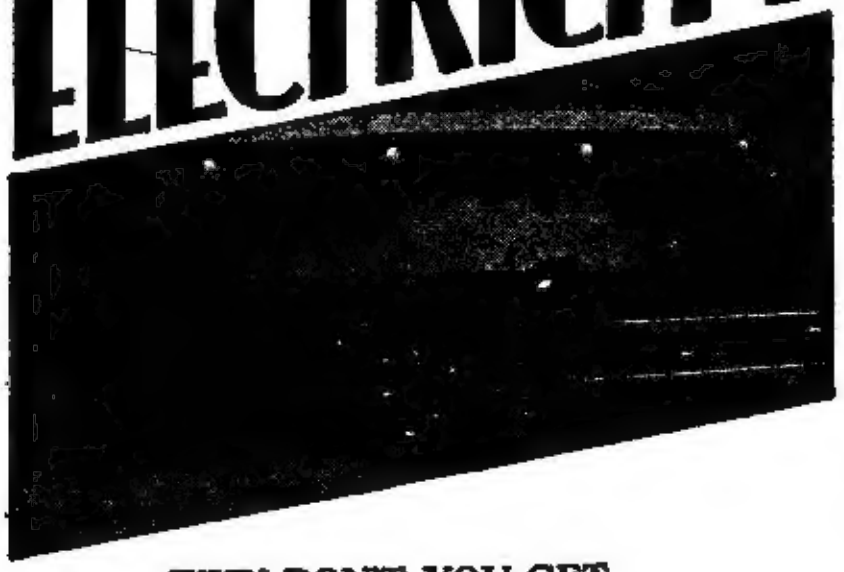
Please send me without obligation or cha your FREE TRIAL and MONEY MAKIN VIX OFFER.

Name.....

Address.....

Town.....State.....

Cooke Trained Men get the - BIG PAY JOBS in ELECTRICITY



HUNDREDS OF OTHER MEN, TOO, say COOKE TRAINING is BEST

$200 a Month Now

"Am now getting $350 a month and traveling expenses, thanks to your course." Clem. L. Bernaldo, Valle Fournho, S. Dak.

Earns $11 a Day

"Am now making $11 a day in Electricity. Your pay boosts for me since enrolling. R. E. Brown, 671 Waverly, Houston, Texas.

$60 a Month Raise

"Boosted my earnings $60 a month in 6 mos. $1,000 a year off by taking Course." in Herman, 598, Drum-Alta, Calif.

$90 a Week Now

$90 a week is my pay now. Not bad for a 20 year old boy. Earned $15 a week when I enrolled." A. J. Curtis, 883 Bantiol Ave., Atlanta, Ga.

WHY DON'T YOU GET INTO ELECTRICITY, TOO?

It's today's great Opportunity for you and every other man who is sick and tired of struggling along on small pay. Hundreds of "Cooke Trained Men" who were no smarter than you when they started now make $3,000 to $5,000 a year—and some even more.

Learn At Home In Spare Time

"Ticket" Methods. It's simple, it's thorough, it's practical. It's just like actual shop experience, yet it's all done right in your own home with the Big Complete Outfit of Tools and Apparatus given to you without extra charge. And it's done in your spare time, without quitting your present job or losing a single hour's pay.

Previous Experience Not Needed

You don't need previous experience—you don't need higher education to learn Electricity the L. L. COOKE Way. If you can read and write, that's enough. This great Training is amaingly simple and clear. There's nothing like it anywhere. It's the Training with hundreds of successful graduates; it's the Training that has put many men on Easy Street; it's the Training for you.

Get Started — Mail Coupon

"Cooke Trained Men" are the "Big Pay Men" everywhere, $60 to $100 a week is what many of them are making. That's the kind of a job for you. Get started under the famous L. L. Cooke Money Back Agreement. Act today to increase your pay. Send coupon for Big FREE Book, "Secrets of Success in Electricity." Mail the coupon now.

L. L. COOKE SCHOOL OF ELECTRICITY

Dept. 309, 2150 LAWRENCE AVENUE, CHICAGO, ILL.

FREE BOOK COUPON

L. L. COOKE SCHOOL OF ELECTRICITY
Dept. 309, 2150 Lawrence Avenue, Chicago, Ill.
Send me FREE and prepaid, your Big Book "Secrets of Success in Electricity," and your Money Back Agreement with all details about your Home Study Course in Electricity.

Name .....
Address .....
City ..... State .....

Residents of Canada send coupon to R. A. Farrow, Special Representative, 7 Medbury Lane, East, Windsor, Ontario, Canada.

The "Cooke" Trained Man is the "Big Pay" Man

Volume 1—No. 6 Publication Office, 404 North Wesley Avenue, Mt. Morris, Illinois
Editorial and General Offices, 96-98 Park Place, New York City
December, 1929

Published by
STELLAR PUBLISHING CORPORATION
H. GERNSBACK, Pres. I. S. MANHEIMER, Sec'y S. GERNSBACK, Treas.

Table of Contents
December

THE BLUE DEMON
By Lowell Howard Morrow.....486

THE FLIGHT OF THE EASTERN STAR
By Ed Earl Repp.....498

THE PHANTOM OF GALON
By J. W. Ruff.....508

FREEDOM OF THE SKIES
By Edsel Newton.....518

FLANNELCAKE'S INVENTION
By H. McKay.....530

CITIES IN THE AIR
(A Story in Two Parts) (Part 2)
By Edmond Hamilton.....534

WHAT IS YOUR AVIATION KNOWLEDGE?
Aviation Questionnaire.....497

AVIATION NEWS OF THE MONTH.....558

AVIATION FORUM.....561

THE READER AIRS HIS VIEWS
Letters From Our Readers.....562

On the Cover This Month

is pictured Ed Earl Repp's story, "The Flight of the *Eastern Star*—the great air liner, the *Eastern Star,*" on its round-the-world flight breaking up a waterspout by dashing through it, in order to save a tramp air liner that has been crippled by the accompanying storm.

NEXT MONTH

THE FLYING LEGION, by George Allan England. There are some stories that for their sheer daring, immense scope, and convincing style, defy adequate description. "The Flying Legion" is such a story. Those lovers of George Allan England will find that it is one of the best stories he has ever written; and those who have not read him before will suddenly realize that they have missed some of the best in aviation science fiction. It is almost futile to try to define adequately the appeal of this epical story. To the lover of aviation, to those who love the strangeness of mysterious places, to the lovers of adventure, and to the lovers of great literature, "The Flying Legion" will come as a great experience. It is truly a worthy successor to "The Ark of the Covenant."

THE STORM NEUTRALIZER, by Ed Earl Repp. The recent tragic disaster of the airplane *City of San Francisco* must have called to the attention of the entire scientific world the immediate necessity of finding a means to combat the ever-present menace of fogs and storms to aviation. Anyone who finds a means to overcome, or neutralize the effect of a storm, will immediately become a great benefactor to mankind. In his present offering, Mr. Repp gives us a most ingenious, as well as scientifically plausible, means of doing this. With his fertile mind, he has created about a storm neutralizer a story which we can unhesitatingly call one of the most exciting he has ever written. And it will call to your attention the fact that a benefactor to mankind often has a stormy path before his value is recognized.

THE DEATH'S HEAD METEOR, by Neil R. Jones. With the publication of this story, the scope of AIR WONDER STORIES is extended through the atmosphere of the earth and into the far-flung empires of space. We go into the future to the time when man is no longer limited to this earthly sphere, and we travel on swift wings into the great spaces where many unknown adventures await us. To those who wish the tying up of future aviation with thrilling adventures in space "The Death's Head Meteor" will be very welcome.

THE AIRPORT OF THE FUTURE, by H. Dominik. The successful round-the-world flight of the *Graf Zeppelin* has aroused a storm of interest as to the future of round-the-world schedules in aviation. Aircraft are no longer limited to comparatively short hops of a few thousand miles; for, with the success of the *Graf Zeppelin* and the building of greater airships, such as the R-101 in Great Britain, the field for long-distance travel by air has been vastly enlarged. But there are many problems to be solved before we can consider that long-distance travel by airship is definitely here. In this article, which we have imported from Germany, we present some astounding, and yet completely practical, methods of solving some of these problems. We are sure that every lover of aviation will enjoy immensely Mr. Dominik's marvelous conceptions.

AND OTHERS.

AIR WONDER STORIES is published on the 10th of the preceding month, 12 numbers per year, subscription price is $2.50 a year in United States and its possessions. In Canada and foreign countries, $3.00 a year. Single copies 25c. Address all communications to Editor, AIR WONDER STORIES, 96-98 Park Place, New York. Publishers are not responsible for lost Mss. Contributions cannot be returned unless authors remit full postage.

AIR WONDER STORIES—Monthly—Entered as second-class matter June 1, 1929, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879. Title registered U. S. Patent Office. Trademarks and copyrights by permission of Gernsback Publications, Inc., 98 Park Place, New York City, Owner of all trademark rights. Copyright 1929, by G. P., Inc. Text and illustrations of this magazine are copyright and must not be reproduced without permission of the copyright owners.

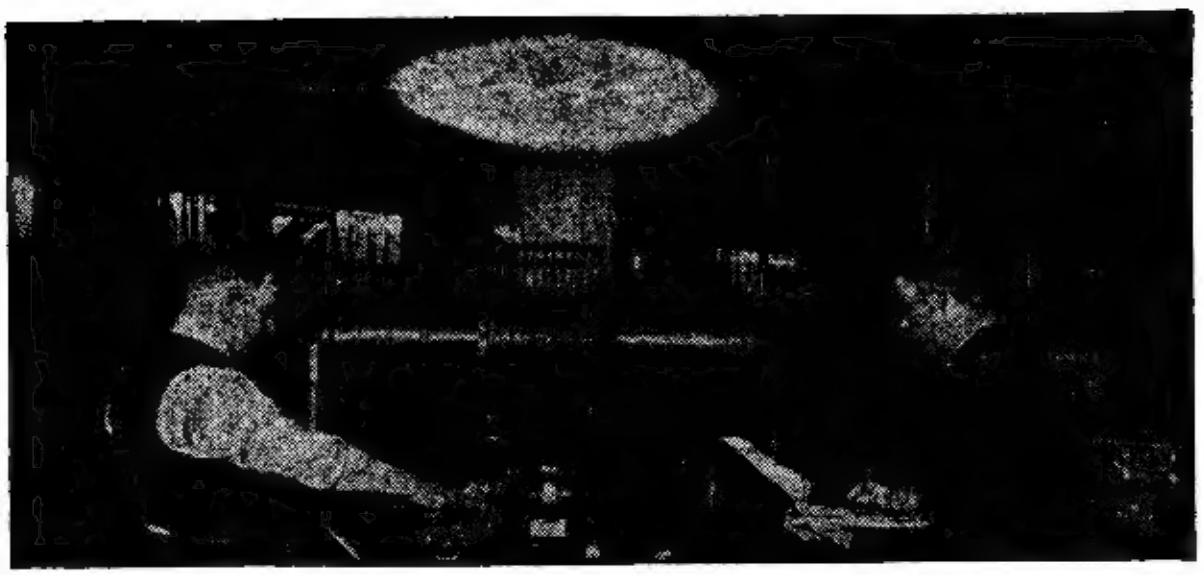
AIR WONDER STORIES is for sale at principal newsstands in the United States and Canada. European agents: Brentano's, London and Paris. Printed in U. S. A.

IF YOU WISH TO SUBSCRIBE to AIR WONDER STORIES, make out all remittances to the Stellar Publishing Corp. Be sure to mention the name of the magazine you wish to subscribe for, as we are also agents for the following magazines: RADIO-CRAFT and SCIENCE WONDER STORIES, subscription price of which is the same as AIR WONDER STORIES, and SCIENCE WONDER QUARTERLY, $1.75 a year. Subscriptions can be made in combination with the above publications at a reduced club rate. Ask for information.

Subscriptions start with current issues. WHEN YOUR SUBSCRIPTION EXPIRES, we enclose a renewal blank in the last number. No subscriptions continued unless renewal remittance received.

Change of Address. Always give us old as well as new address and notify us as far in advance as possible.

STELLAR PUBLISHING CORPORATION
Publication Office, 404 North Wesley Avenue, Mt. Morris, Illinois. Editorial and General Offices, 96-98 Park Place, New York City.



500,000 VOLTS

"Artificial lightning" being developed in COYNE school. Spark of 500,000 volts is shown jumping 30 inches. This gigantic Tesla coil is the same as that used by Steinmetz, absolutely harmless because of high frequency.

LEARN ELECTRICITY Without Books or Lessons in 12 Weeks

By Actual Work - In the GREAT SHOPS of COYNE

Anyone who can see and understand the English language can master Electricity in 90 days. I teach you with the most complete outlay of electrical apparatus ever assembled in any school—30-foot control board—2-story transmitting stations—skeleton houses, huge motors of all kinds—dynamos—sub-stations—automobiles—switchboards. **In one department we generate enough electricity to supply a small city!**

No Books - No Lessons - No Classes

ENTER ANYTIME. Experts teach you without books or classes. They guide you every step of the way with individual attention. You do the actual work on real full-size machinery in full operation. Take motors for instance. Instead of learning from books and charts—you actually build motors. You can't help but know all about them. Anyone can learn this fascinating way.

No Experience Necessary

That's how my methods make men master electricity in 12 wonderful weeks. You don't need experience—Coyne training starts from the very beginning. You don't need advanced education—you learn by doing. Age is no handicap—Coyne students range from 16 to 40.

TRIPLE YOUR EARNING POWER

I don't need to tell you about the opportunities in Electricity. They are too many and too amazing to mention. Ordinary jobs run from *$50—$75—$150* a week. And Coyne training leads to the biggest positions.

COYNE Electrical School
H. C. LEWIS, President — Founded 1899
500 S. Paulina St., Dept. 99-01 Chicago, Ill.

Many Coyne men are making up to *$600* a month. Demand for Coyne men often exceeds the supply. Our Employment Bureau secures dozens of positions weekly.

EARN While You LEARN

We help many students to secure part-time jobs to earn a good part of living expenses while learning.

Railroad Fare to Chicago Allowed

Right now I am including railroad fare to Chicago and complete courses in Radio, Aviation, and Automotive Electricity without extra charge.

ALL DETAILS SENT FREE

This school is 30 years old—Coyne training is tested—proven beyond all doubt—endorsed by electrical industry. You can find out everything absolutely free. Simply mail the coupon and let me send you the big, free Coyne book of 150 photographs—facts—jobs—salaries—opportunities. See what Coyne training can do for you in just 90 days! This does not obligate you. So act at once. Just mail coupon.

Get This Free Book

H. C. LEWIS, *PRESIDENT*
***COYNE ELECTRICAL SCHOOL*, Dept. 99-01**
500 S. Paulina Street, CHICAGO, ILL.

Dear Mr. Lewis:—Without obligation send me your big, free catalog and all details of Railroad Fare to Chicago, Free Employment Service, Radio, Aviation and Automotive Electrical Courses you are including, and how many "earn while learning."

Name .....

Address .....

City ..... *State* .....

NOW . . . .

for the HOME LIBRARY CLUB HOTEL

You May Obtain

Science Fiction Classics

THOUSANDS of science fiction fans who have always desired to build a library of science fiction books, may now do so because of an unusual means of publishing them that we have been able to work out.

We are gathering together a number of Science Fiction Classics, including the best works of the foremost writers, of which

"Between Worlds"
By Garret Smith

is the first of the series. Printed on durable paper, with stiff covers, size 6 x 9 inches, running 80 to 100 pages, these Classics deserve a place on your shelves between the choicest books of your library.

These books we will publish are now out of print and they are to be obtained only through our Science Fiction Classic Series.

"Between Worlds," the first of the series, is a most marvelous interplanetarian story. All the complexities, fascination and the strangeness of the civilization of another planet are revealed to us in Mr. Smith's most vivid manner.

Each of these books will be on sale only a short time, and, therefore, if you wish to start your series, you must not miss this opportunity of mailing at once the coupon attached below.

A new book will be published each month and, therefore, you will find that within a short time you will have accumulated a most desirable and valuable library of the best that there is in science fiction.

Only the best is good enough for your Science Fiction Library

Not Sold on the Newsstands These Books Can Only Be Had from the Publishers.

50¢ the copy

Publishers also of
Science Wonder Stories
Science Wonder Quarterly
Air Wonder Stories
Radio-Craft

Published by
Stellar Pub. Co.
98 Park Place
New York, N. Y.

GET THIS NOW

STELLAR PUBLISHING CORPORATION,
98 Park Place, New York, N. Y.

Enclosed please find fifty cents (in U. S. stamps, cash or money order—Canada and foreign 10c extra) for which please send me "Between Worlds" by Garret Smith, the first of your Science Fiction classics.

Name .....

Address .....

City ..... State .....

. . . BUILD A MODERN SCIENCE FICTION LIBRARY

VOLUME 1
No. 6

AIR WONDER • STORIES

DECEMBER
1929

• • • • • • • *The Future of Aviation Springs from the Imagination* • • • • • • •

HUGO GERNSBACK, *Editor-in-Chief*

DAVID LASSER, *Literary Editor*

FRANK R. PAUL, *Art Director*

Associate Aviation Editors

MAJOR WILLIAM A. BEVAN, B.S., M.S., M.E.,
Air Corps Reserve
Professor Aeronautical Engineering, Iowa State College

PROFESSOR GEORGE J. HIGGINS, B.S. Aero. Eng.
Associate Professor Aeronautical Engineering, Univ. of Detroit

PROFESSOR EARL D. HAY, B.S., M.S., M.E.
Head Department Mechanical and Industrial Engineering and Professor of Aeronautics, University of Kansas

PROFESSOR FELIX W. PAWLOWSKI, M. & E.E., M.S.
Department of Aeronautical Engineering, University of Michigan

PROFESSOR JOHN E. YOUNGER, B.S., M.S., Ph.D.
Dept. Mechanical Engineering, University of California

These aeronautical experts pass upon the scientific principles of all stories

GLIDER FLYING

By HUGO GERNSBACK

THE oldest form of human flying is certainly glider flying. Such early experimenters as Lilienthal, Chanute—as well as Wright Brothers—all used gliders without motors.

Gliders are of several different types, the early gliders having been double- and triple-winged; whereas the modern gliders of to-day are of the monoplane variety.

At the present time, glider flying threatens to become the sport of the air and is coming rapidly to the forefront in this country. During the period after the war, the Germans have done marvelous work in glider flying and, recently, a young German stayed aloft over eighteen hours in one of these gliders, relying simply upon the updrafts of the air to keep him aloft.

This may sound incredible; but it is an accomplished fact, and shows us what may become possible in the future.

Roughly speaking, the modern glider takes advantage of the upward currents of air, particularly as they occur around hilly country. This is considered true glider flying; but there is still another method whereby a glider can be towed by means of either a motorboat, an automobile, or a regular motored airplane.

The automobile towing and motorboat pulling methods are, however, not considered good form by glider experts, who prefer to soar like birds free of all entanglements.

Of course, our work in glider flying is as yet a crude beginning, and no one knows its possibilities. Sooner or later, it may develop into a commercial means of transport in a manner that we do not even suspect to-day.

For instance, the Germans have recently made a number of experiments which were highly successful. Two gliders were towed by means of long ropes by one engine-propelled airplane. Thus they have made a real train, similar to our locomotive-and-car combination. They argue that, with little additional energy, it is possible to lift up three airplanes, two of which are engineless, and transport either passengers or freight through the air at an exceedingly low cost. This seems plausible because the greatest part of the weight of an airplane is the engine, and this is absent in a towed glider. The extra weight, usually taken up by the engine, can be used in the glider for freight or passengers. When the towed glider nears its destination, the pilot of the glider cuts loose from the tow line and glides down to earth. This landing, the Germans point out, is very much easier to accomplish in a glider than in a motored plane; because the angle of glide is much less on a glider—it can cover a greater horizontal distance while descending.

All sorts of possibilities, aside from the sporting element, open to us in the field of gliders. We may be sure, for instance, that the future air liners will carry "lifeboats" in the form of gliders. Other possibilities are gliders with a sort of auxiliary engine; without propellers, but using rocket propulsion through compressed air or some other means. The auxiliary power system would be used only to maintain altitude. For instance, a glider, if it were released from an altitude of one or two miles, could glide down in a flat angle, thereby covering a distance of thirty or forty miles in such a glide. No power of any kind would be needed, except to lift the glider up to the required height. It may be even possible to go back to the old hot-air-balloon system to raise the glider to the necessary height. Ordinary straw or wood burned underneath the balloon-like contrivance would furnish all the buoyancy for a temporary paper or silk balloon to lift up the glider.

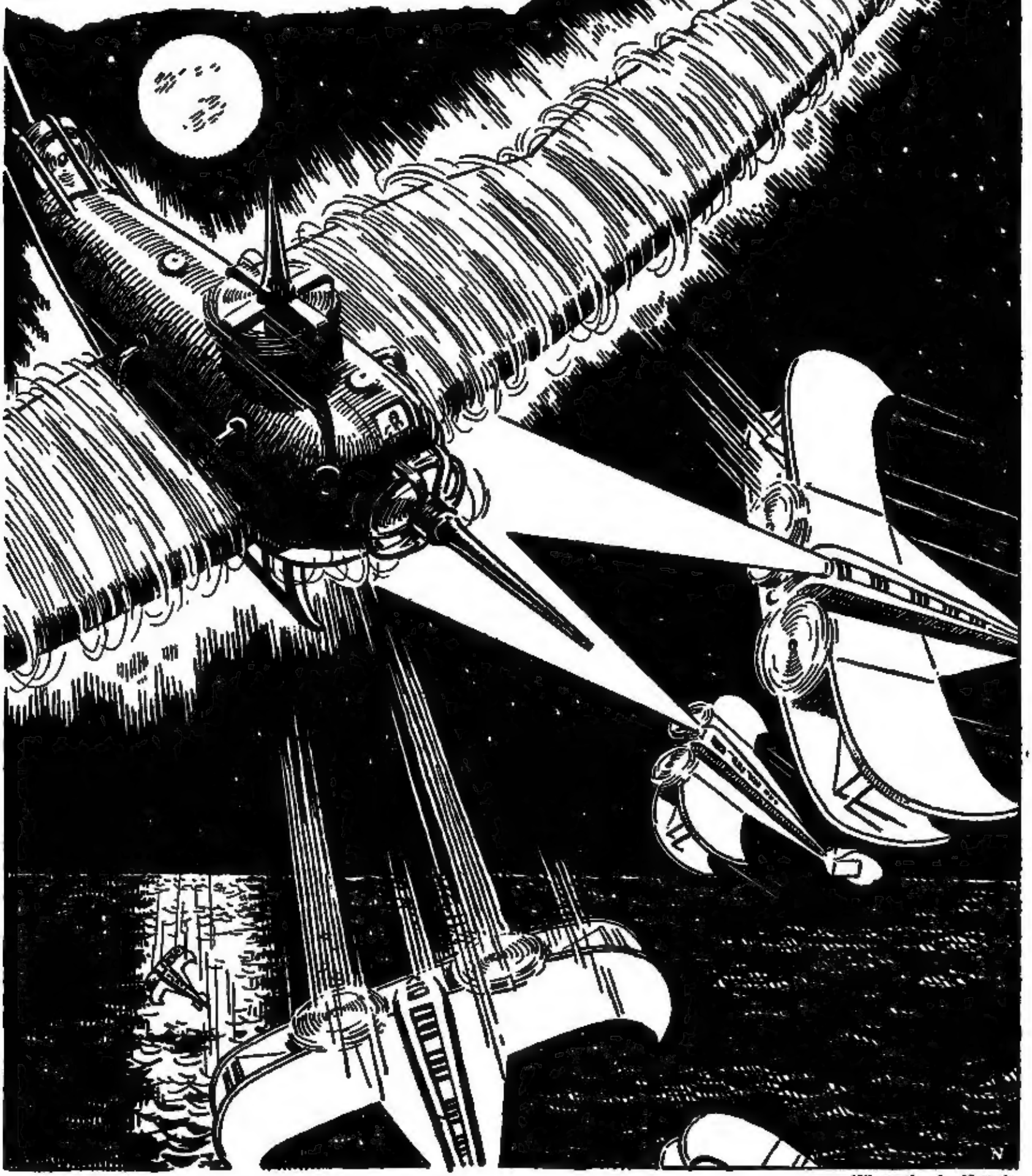
On the other hand, there is a tremendous possibility in every country for gliders, purely as for sport. While no such spectacular flights have been made in this country as in Germany, the time is rapidly nearing when America will be on a par with Germany in glider construction and operation.

And let no one think that it is an expensive sport. Good gliders that can carry one man can be built anywhere from $50.00 up, and they can be flown practically anywhere where there are hills or where there are prevalent winds with a velocity of fifteen to twenty miles an hour. Nor is the new sport dangerous; for the planes are very light. Even a crash is of little consequence; and there seems to be no record of anyone having been killed flying a modern glider.

Glider flying is certainly one of the greatest and most exhilarating sports as yet devised.

The Blue Demon

By LOWELL HOWARD MORROW



(*Illustration by Nutter*)

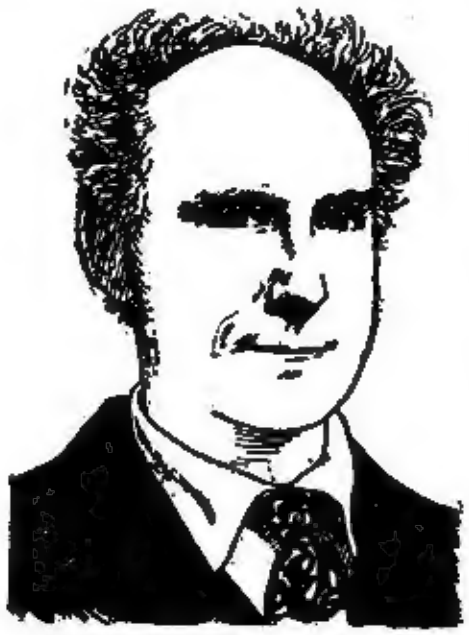
And now the remaining planes, unmindful of the awful power flashing from their adversary, charged straight at him. But before they were fairly under way, one of them began to wobble; then it dropped in a tail spin to the sea.

By the Author of "The Air Terror"

MY plane was a complete success. Having won for our nation a sweeping victory and thus caused its adoption by the United States government as our chief type of aircraft, I was intensely gratified. Jealously guarding the salient features of its construction, and swearing every air official and pilot to secrecy, the government sought to maintain its monopoly of the invention. Although I wast still horribly crippled in body by my fall in the hour of victory, I could endure the hardships of my new life in the knowledge that I had helped save my country. Only one cloud shadowed my happiness, and that was the disappearance of my old friend, Lon Grand, the man who had made my success possible.

Our late enemies had resumed diplomatic intercourse with us, and the whole world was again at peace. And then, with the stunning suddenness of a thunderclap from a blue sky, came new rumblings of disturbance to our security.

My good friend, Colonel Brandon, who had been promoted to the command of the First Corps of our air squadrons, was lost at sea with every ship of his fleet, which comprised three hundred of the largest and swiftest aircraft in the service!



LOWELL HOWARD MORROW

The first tidings of the disaster came by radio to the Air Department at Washington. It came with shocking brevity.

"We are attacked—half the fleet is down," was the brief and startling message which came at once from a score of ships on this beautiful summer day. Then there was only silence—profound and mysterious. In vain the radio operators throughout the country tried to pick up further details. Every ship on the sea and in the air, within a radius of five hundred miles, was besieged by frantic appeals for definite news of the tragedy. But none had seen the air fleet. Colonel Brandon had reported his position but two hours before, being then twenty miles due east of Minot Ledge light and going into formation for the monthly coast-defence maneuvers.

Then came the sudden message, and silence! But for the fact that Colonel Brandon's command failed to answer even their code signals, the Air Department would have been inclined to treat the matter as a huge hoax or the miscarriage of air messages.

Swift scouting planes were dispatched from Boston, and the sea for hundreds of leagues around the First Air Corps' last known position was searched in vain. Not a clue, not even a scrap of the great air fleet could be found; it had completely disappeared. Yet, since all were seaplanes, it seemed incredible that all could be forced down and leave no trace upon the sea.

One by one, the scout planes returned to their home base. Messages came from all over sea and land that the fleet had not been sighted after that last report to the Air Department. The mystery deepened. Many theories were advanced, only to be rejected as untenable. How could a great air fleet in the broad glare of day, in perfect flying weather and during times of peace and security, suddenly disappear and leave not a trace? Yet that seeming impossibility had happened. Besides the frenzied message to the Air Department, there remained not the slightest token to denote that a major calamity had occurred.

All through the night the search went on, and the perplexity and curiosity of the nation grew apace. Everybody knew that it was clearly impossible for a large air fleet, over either land or sea, to be obliterated within the space of a few minutes. The thing was unprecedented and beyond the pale of reason. So great was the excitement of the people that countless thousands remained awake, and by every known means of communication importuned the authorities for news of the fleet. Yet there was no news to give.

A Strange Tale

THEN early the next morning a privately-owned seaplane crept disabled into the harbor at Boston. Its owner, a well-known business man, and his wife, told a weird and unbelievable story. It seems that they had been cruising at a high altitude at noon the previous day. Their position was a hundred miles east-north-east of Strawberry Point, and through their glasses they saw Colonel Brandon's ships circle out over the sea and begin their maneuvers. Although the air cruisers were several miles distant, the air was clear; and the movements could be seen plainly. Suddenly the watchers saw a score or more of the planes, scattered here and there among the fleet, break from the lines, gyrate strangely, then bank and dive into the sea. At once the formation was broken; many planes now began to dart about in confusion, and they saw others falling out of control. For an instant the flagship seemingly attempted to rally them and restore the line. It was in vain. Rapidly the planes were falling; but there was no battle—no foe of any description was in sight.

NO doubt, you have enjoyed "The Air Terror." If you did, then this present effort by the same author will prove an enjoyable continuation of Mr. Morrow's ideas. This author has a way to keep you guessing, and to keep your excitement at a high pitch at all times. You are not permitted to relax for a single second while he spins his tale.

Incidentally, Mr. Morrow has evolved a number of brand new ideas which, sooner or later, will be used for warfare. It is becoming recognized that it may be much easier in combat to cripple the engine of the enemy's plane than to attempt to puncture it with bullets. Aerial warfare of the future may well be fought over great areas and some long-distance method of bringing down an enemy may have to be evolved. Mr. Morrow's methods of working this out are ingenious, to say the least. None of them can be termed impossible or even improbable.

The two spectators gazed in awe and wonder, as they realized that some strange and terrible force was working havoc with the fleet. They swept both sea and air with their glasses; there were no boats in sight, and the air above the fleet was free from planes. Only a few, low-hanging clouds were visible, and above them the sky was blue and unflecked by a single object. But, while they continued to gaze in amazement, plane after plane pitched about, rolled over, then dived down to its doom.

Nearly all were down and had been swallowed by the sea when the watchers' own plane developed motor trouble, and they had to glide down. Being without a radio transmitter, they were unable to report at once the mysterious catastrophe; and only after many hours' work on the motor were they enabled to limp into Boston.

The whole nation was stunned. Out of a peaceful sky had come sudden death to more than two thousand men, and destruction to the stanchest air fleet in the world. Every ship was constructed throughout of metal, and was supposedly capable of keeping afloat in a rough sea for hours. Yet all had been destroyed in a few minutes, and not even a scrap of wreckage had been left to tell the tale. Uncle Sam's newest and best-equipped air squadron, which our military experts had declared invincible, had been annihilated within an hour of our coast.

But it seemed that nothing could be done about it. No aircraft had been seen above or below the fleet, before its destruction began. Neither had there been visible a warship or a submarine near to husband other planes; and, even though there had been such an agency bent on the destruction of our planes, how could it have accomplished its purpose so swiftly and completely? Nor could the government, through all its diplomats and agents, located in every capitol on earth, obtain any inkling as to the cause of the disaster. Other governments and the foreign press were very sympathetic and courteous; but all other nations were as much in the dark as and mystified as we. It was as though an avenging angel from on high had suddenly appeared and smitten the planes. Soundings were made at the point where the fleet was reported to have gone down; but the depth was too great for the work of divers, so nothing was salvaged to aid in the solution of the mystery.

After a few weeks the wrath and the excitement of our nation began to cool; and, as the weeks merged into months the prominence of the affair faded as life resumed its normal course. The tragic loss of the air squadrons was recorded among the archives of the world's unsolved riddles. Folks now began to doubt the story of the Boston aviators. Meanwhile the government was still secretly probing the mystery while it set diligently to work to repair the loss.

It was then that the whole country was shocked by a sudden repetition of the dire tragedy—but this time over the land.

It was late in the afternoon in mid-November; the sky was overcast and the earth below was drenched by fog banks swept along by a cold, raw wind. The Sixth Air Squadron, comprising more than one hundred fighting planes, while returning to the home port at Annapolis from maneuvers in the west, was feeling its way through the fog above the Blue Ridge Mountains. Suddenly radio messages leaped out of the air with the direful intelligence that it had been attacked without warning by an unseen foe; that the planes, suddenly thrown out of control, were pitching about wildly and crashing into the hills. And then, as in the case of Colonel Brandon's ill-fated command, communication with the fleet abruptly ceased.

The Air Department at once ordered all available planes to the rescue. Since I happened to be in Annapolis on a motor trip I swung out of the automobile on my crutches (on which I was now able to move a short distance) and made my way over to the flagship of the fleet.

"Want to come with us, Mr. Clare?" inquired Commander Benson genially.

I nodded and he helped me into the cabin.

We were all too much excited to talk as we shot up through the banks of fog and then darted westward toward the Blue Ridge.

Although our speed was great, darkness had fallen by the time we reached the vicinity of the disaster. The dreary blackness of the night was intensified by a cold rain that swept down from the north. Beside the moan of the storm, the slither of the rain across the wings, and the subdued murmur of the motors there was no other sound. But the fog had lifted and we shot our searchlights into the gloom in search of the foe. Nothing but the flare-illumined hills was visible Then fearfully we set the beams of our lights earthward, hoping against hope and dreading the revelations we knew were in store for us.

Soon we located the crumpled wreckage of the squadron, strewn over the rocks and scattered about over the bushes and among the trees of the forest. Some planes were impaled on tree-tops, some had crashed against hillsides; and others lay deep and almost concealed at the bottom of wooded gulleys.

CHAPTER II
What the Planes Revealed

AS we dropped down, seeking a spot on which to land, it was apparent that every plane had been destroyed. As before, the work of the unseen fiends had been thorough. But here, at least, they had left a clue. Here no sea had destroyed the evidence. Here we had something tangible to work upon.

We finally landed on a flat space, near one of the crushed planes. The officers, with Commander Benson in the lead, sprang from the cabin and rushed to the wreck. On my crutches I hobbled after them as fast as I could with the assistance of two of the crew. And then, standing there huddled together in the rain, we stared dumbfounded and speechless at the ghastly sight our flashlights revealed. With one glance we saw that all the bodies of the plane's crew were in the cabin; none had had a chance to jump. Two of the pilots still sat in their seats, their stiffened hands gripping the controls, their staring eyes wide and terrified as though death had come unexpectedly. The remainder of the crew sat in their places or sprawled on the floor. But the most appalling thing about them was their color; the skin of each was a pale, yellowish blue! We pulled up the sleeves of one and opened his shirt front. His whole body was blue! But we could find no wounds, abrasions or burns of any kind.

We saw that all had been killed instantly by some subtle and powerful force. Nor did the planes themselves show any marks of battle; what damage they had received came as a result of the crash.

Commander Benson sighed and looked around with a bewildered stare. I saw that he, like the rest of us, was completely mystified.

"God!" he breathed at last. "This is awful! And

the color of the corpses! I never saw anything so horrible. To think that the boys had no chance—never a chance!"

Upon the mountain slopes and through the valleys we could now see the bobbing lights of other searching parties. Some were near us and hoarsely called out their reports and discoveries. All coincided with our own.

"I almost believe that we are dealing with the devil himself," said Commander Benson grimly: "These men have been killed by some electromagnetic agency, I am sure. Yet we find no burns or marks upon their bodies, nor do we find signs of fire upon the planes. But the eyewitnesses of Colonel Brandon's destruction affirm that they distinctly saw fire enveloping at least one of the planes, as it plunged to the sea. However, what they saw might have been the flashes of sunlight on the metal parts."

"Despite that fact, we may have here a different method of destruction," I suggested.

"That is possible," agreed Captain Collins: "Here, as in the case of the Brandon tragedy, our known facts are meager. We are at peace with the whole world. For months there has been not even a diplomatic quarrel. And here we can find no trace of an enemy. Where, then, can we look for a solution to this dark mystery?" The captain paused and looked at us with a startled air.

Commander Benson stared and scratched his head thoughtfully.

"We have one thing to work on, Commander, I said. "You will recall that only military planes have been attacked. And it is only our planes that were destroyed; and it is a significant fact that they were the most powerful in the world, so far as we know."

"By George, I believe you are right, Clare," said Commander Benson: "Our enemy, whoever he is and however he accomplishes his dastardly work, has a military reason for it."

"And it strikes me that he has covered his tracks well," said Captain Collins, dryly.

"Not by a damned sight," snapped Commander Benson, glaring about him savagely: "We'll get this blue demon of the skies or sell our lives in the attempt."

"Amen," we all agreed solemnly.

The Dearth of Clues

UNFORTUNATELY, there was nothing we could do that night to salvage the planes or to succor their unfortunate crews; for all were dead, all tinted by that horrible blue color, all with that expression of surprise and wonder on their faces.

We sought shelter from the storm in an airport across the mountains and sleeplessly awaited the coming of the dawn.

The day broke bright and clear, and after a hasty breakfast we returned to our sad task. The bodies of the brave airmen who had sacrificed their lives to an unknown foe, without opportunity to strike a blow in their defence, were gathered together reverently and conveyed to Washington. During all this work we made but one more important discovery—nearly every plane had been smashed beyond repair.

Diligent inquiry among the residents of the sparsely-settled region failed to bring us any clues. No one had either heard or seen any strange planes in that vicinity—only the regular mail planes had passed. No one had heard any sounds of battle or commotion in the skies. Nor had any strangers been seen upon the roads for many weeks. Those abroad on the roads in the vicinity of the tragedy on the night of the storm had seen or heard nothing unusual.

We kept up our inquiries for days, and patrolled the air for miles around, but without result. And finally we were forced to go home; sadder, but no wiser.

The national wonder and excitement following this tragedy was even greater than the aftermath of Colonel Brandon's end. As usual in such cases, the public blamed the government for not discovering and punishing the miscreants. Mass meetings were held in every important city, and red-faced orators called loudly for action against the weaklings in our administration. Resolutions condemning everything and everybody in general were offered and adopted by the score. Action! Action! was the cry. The censure of the Air Department was unreasonable in the extreme. The public wildly demanded an investigation, and the removal and punishment of certain high officials, whether guilty or innocent. With the blood scent in their nostrils they were looking for some prey. It was pertinently asserted that, probably, the secrets covering our military planes had been betrayed to a foreign power; and that men high in the councils of state, in collusion with said government, had entered into a conspiracy to destroy our chief arm of defence. Incredible and preposterous though as this accusation was, it found thousands of adherents among the thoughtless; thus embarrassing the administration and hindering any sane solution of the problem.

While public opinion was still at white heat and official Washington seemed on the verge of collapse, the nation was terrified by the news that our unseen and unknown enemy had again struck. This time the victims were small groups of planes and single units far removed from help; but the results were the same. Our men had been sent to their death without warning or a chance to defend themselves. In no instance did these planes have an opportunity to use their radio. The same sickly blue tint was found on the victims' skins. Although, in a few instances, the planes had been seen to go into a spin and fall, no one had seen what struck them down. All declared that this awful power, whatever it was, was invisible and the most deadly thing the world had ever known. There was no clue, no explanation, no chance to apprehend the terrible destroyer. We were further astounded by the news that the agents of this monster had struck in a score of places within the short space of an hour; and always the victim had been a military plane!

The nation all but went mad. For days both business and industry were virtually suspended; men and women throughout the country stood about in groups discussing in accents of awe and terror the visitations of this power. It was apparent to the most obtuse that, unless this damnable thing were speedily curbed and rendered harmless, our country would soon lie prone and helpless under the heel of a conqueror. Yet what was to be done? How were we to grapple with a foe that could not be heard or seen, the only evidences of whose existence were the grisly reminders of its visits? But we were somewhat comforted by the fact that the whole civilized world sympathized with us. Every power, large and small, sent condolences and lavish offers of aid. But these gracious sentiments, reassuring as they were, did not help us to solve the mystery. The situation was acute—the future pregnant with horror and disaster.

In sheer desperation the Air Department finally sent for me. Why it did so, God only knows, for I was plunged as deeply in the morass of fear and uncer-

tainty as any nephew of Uncle Sam. However, I went gladly; though I was somewhat ill at ease as I entered the council room and gazed upon the grim, gray faces of the nation's leaders grouped about the long table.

I have known Commander Benson for years, and I want to state now here that no braver man ever sat at the controls of a plane; but when he came forward to meet me, and took my hand, there were tears in his honest blue eyes, and for a moment he could not speak.

"Clare, for God's sake help us," he finally said hoarsely: "We are at the end of our rope and unless something is done mighty quick our country will be on the rocks."

"How can I help?" I asked humbly.

"I hardly know," he replied with a gesture of despair: "But we have hoped that, as the inventor of the plane, you might be able to suggest something."

"One of the inventors," I corrected sharply: "You forget that there was another associated with me."

We then went over to the table where Commander Benson introduced me—really a superfluous proceeding, as I was known to nearly every man there.

"We earnestly desire your opinion, Mr. Clare," said the Air Secretary, "with regard to this nameless scourge that has swooped down upon us. We think that you, perhaps, may be able to show us a way out. Please speak frankly."

My Plan

I GAZED about the room. The heavy shades on the windows were down and the doors were closed.

"Have no fear," said the Secretary divining my thoughts: "We speak behind closed doors, and the entire building is under guard."

"Gentlemen, I deeply appreciate this confidence," I said, "though I fear that there is little I can do to unravel the net of perplexing circumstances that surrounds us. However, I have arrived at certain conclusions which I have hitherto thought best to keep to myself, but which I now frankly make known for what they may be worth. Allow me to say, then, that it seems to me that we are still psychologically at war with those powers with whom we made a formal peace several years ago. Our victory over them, as you know, was due to the superiority of our planes. This bitter fact still rankles in the hearts of our erstwhile foes. Ostensibly at peace with us, I believe they have secretly invented some devilish engine of destruction and engaged in this underhanded campaign to destroy our chief arm of defence. When this is accomplished, they will come out into the open, declare war and have us at their mercy. It is clear to me that they must have a base somewhere in the old world, also one here in America. I would advise that a close watch be kept on all the capitals in the East."

"Our secret service men have been working in those countries since the loss of Colonel Brandon's fleet," said the Secretary: "but they have found nothing."

"As the attacks have all been made on our military planes," I resumed, "I think it would be wise to remove all such planes from active service, so far as possible, and confine them within their hangars and home fields until we can locate and grapple with this menace which Commander Benson has aptly named the 'blue demon.' And, since this destroyer, whatever it is, comes out of the skies we must look for it there, we must battle and overcome it there.

"I am convinced that this unknown enemy of ours is using an electromagnetic force," I went on: "It may come from a great distance, or it may be directed at comparatively close range. But it has occurred to me that we might insulate against it. Of course we do not understand the nature of this ray—if ray it is—for, although invisible, it leaves a blue stain which would indicate that some sort of chemical action forms one of its characteristics. Yet, I believe that we can insulate against it. Our secret air patrol should be greatly augmented; but I would suggest that all planes be sent into the air in single units widely scattered."

"Clare, I think your idea of insulating the planes a mighty good one," spoke up Commander Benson: "Somewhere in the air this deadly thing lurks. But what, in God's name, are we to look for? No one has reported any suspicious-looking aircraft loitering about, and who among us is astute enough to recognize this blue monster should we meet him?"

Of course no one had an answer to these perplexing questions. Indeed, it seemed an absurd and impossible task, to hunt for and fight an invisible foe. That we had to thank an old enemy for these hellish crimes, there could be no doubt. But what enemy? We could not charge any nation with such dastardly conduct in times of peace; such an accusation would be equivalent to a declaration of war. Yet all realized that something must be done, and that soon. The temper of the people demanded drastic action of some sort. War with all its carnage and heartache was preferable to this supine submission to the frightful attacks of an unknown foe.

For several minutes a poignant silence hung over the room; the very atmosphere of the place was eloquent of the uncertainty we felt. All realized that the life of a mighty nation was at stake; and the thought came to me that here among those grim and silent men about that table must be found a savior.

At last General Marshall rose in his place. His face was pale and seamed, his lips set; but his eyes, denying the years of his snow-white hair, blazed with the ardor of youth. General Marshall had been a pioneer in the early days of the air defence; he had sounded the tocsin of warning and the call for an adequate air fleet until he had won his point against immense odds. Now his advice was eagerly sought and followed, even by those who once had been his bitterest opponents.

"Mr. Secretary," he began in clear, firm tones, "I recommend that Mr. Clare's—"

He paused abruptly and stood staring wide-eyed at the loud speaker in the center of the table as the Air Department's code signal rasped out on the air.

"Mr. Secretary," came the announcer's hoarse voice from the government airdrome at Annapolis: "I have the duty to report that three more battle planes have just crashed on this field; and our hangars are in flames!"

We stared at one another in helpless dismay. Slowly, as in a daze, every man got to his feet and waited breathlessly for the next words. This was the most stunning blow that had yet been struck. They were boldly attacking our planes in their home ports! They were burning our hangars before our very eyes, and it seemed that we were helpless to do anything to thwart them. We gazed in awe at the loud speaker, but no further words came. In some manner the announcer had been cut off.

"I recommend that Mr. Clare's proposal be adopted," continued General Marshall at last, his cool, collected voice tending to relieve the tension: "I further recommend that he be placed in charge of our air scouts and empowered to act at his own discretion and in his own way; that all red tape pertaining to his duties be slashed

at once, and that he be given every possible aid in the execution of his plans."

CHAPTER III
After the Demon

AT once a loud clamor arose. The enemy was at our doors again, we must get a fleet under way immediately and hunt down this destroyer; there was no time to lose in experiments—and so on. But in the midst of this hue and cry General Marshall held up his hand for silence. At last, in deference to his years and experience, the commotion ceased.

"Gentlemen," resumed the general, "I beg you to curb your impatience. To assemble and send out another fleet against this masked invader would be sheer madness. Our inability to cope with him openly has been demonstrated to our sorrow. We are dealing with a new form of enemy, unseen, deadly and without mercy. As Mr. Clare has suggested, our best hope is to render our planes immune to his thrusts—if we can do so—for only in this way may we learn the secret of his power and destroy it."

"Mr. Clare, how long do you think it would take to insulate a fleet of—say—a dozen scouting planes?" asked the Secretary.

"Perhaps two weeks," I replied: "But I take pleasure in informing you that already I have one plane in readiness." They all turned in their chairs to stare at me incredulously. "I have anticipated the need of such a plane," I went on.

"And you are ready to take the air in it?" gasped the Secretary.

"I am, with your permission."

"Good!" exclaimed the Secretary, his face brightening: "How do you propose to work?" he added quietly.

"I hardly know," I confessed: "Our task is unprecedented and we fight blindly. Circumstances must largely guide our action. We know not where to look for this monster. But I propose to go into the air after it, to stay in the air, refueling from supply planes, until I either run down and destroy this infernal power or am destroyed by it."

A murmur of applause followed, but I was far from feeling as brave as my words. This indefinable, unseen terror had worked on my nerves, too, and I was in very truth fearful of the ultimate outcome. To lose our envied position as leader of the world's air powers was humiliating enough; but to have these children of my brain destroyed without being able to strike a single blow in their defence was maddening.

Commander Benson sprang to his feet.

"I urge that Mr. Clare's services be accepted at once," he said crisply, "and that he be dispatched on his errand without delay."

"You shall have a free hand," said the Secretary, shaking my hand. "Pray take your insulated plane and go at once; and may God speed you! What pilots do you wish to accompany you?" he added, quickly, as we passed into the crowded anteroom.

My eyes swept the faces of the airmen present; there were many aces there, all time-tried and true. The available supply was great; but when I saw Captain Price (Colonel Brandon's son-in-law) and Captain Collins looking at me longingly, my choice was made.

"I will take Captain Price and Captain Collins with me, Mr. Secretary, if you please," I said.

They came forward to thank me for the compliment; but I waved them back with a smile.

"Come, let's go!" I said, swinging toward the door on my crutches. With our hangars burning and our whole air fleet menaced with destruction, I knew there was no time to lose.

We took to the air that very night and began an aimless ramble through the skies. I say aimless; and such it was, so far as destination and a campaign of action were concerned. We realized that one lone plane against an invisible antagonist of whose size, power and location we had but vague conceptions, stood but a meager chance of success.

The weather was cold but beautiful. Not a cloud drifted across the star-studded sky. There was scarcely any breeze and the air was clear.

To our surprise the weather continued fair for the next three weeks, and we enjoyed it to the best of our ability considering the constant strain we were under. It was one of those calm, clear Decembers we sometimes have along the Atlantic coast. Day and night we sailed the sky, sometimes far inland, at others far at sea, changing our course and altitude frequently. But nothing occurred to stir our blood or mar our voyage. All was as serene and peaceful as a country churchyard. The demon had not been heard from again. The people began to lose their fear, and we to feel like fools on a wild-goose chase. But the government did not relax its vigilance. By this time more than a score of the new, insulated planes were on scouting duty.

Then, one day, as we flew high over the ocean, the weather suddenly changed. Clouds began to gather and roll up from the east. The wind freshened and brought with it a chill. In less than an hour, we were among the clouds, and so we dropped to a warmer stratum of air. The cloud banks mounted rapidly, and we thought that the whole heavens would soon be blanketed; though the sky to the west was still clear and blue.

We turned landward, not wishing to be caught in a storm. But, as we sped on, I looked back at the rolling clouds and studied them idly. Then my attention was suddenly attracted to four curiously-formed clouds, detached from the main mass and drifting slowly northward. These cloud formations, perhaps a hundred yards in circumference, were white and irregular in shape with long, feathery streamers and columns protruding and floating from the edges and curling about the main body. And, as I looked, I fancied that there were spots on the surface that billowed, rose and fell, puffed up and subsided like the slow exhaust from a steam pipe. And, in the center of each cloud, was a mass of snow-white vapor such as one often sees scurrying over the water in the lap of a gale. Through the binoculars the clouds seemed to be composed of fog particles rather than rain-laden vapor.

"Funny-looking clouds," remarked Captain Price, observing my intense interest. I handed the glasses to him.

"Damn curious," he said, calling Captain Collins' attention: "The barometer remains stationary and I can see no cause for this peculiar condensation."

"Their motion is contrary to the drift of the lower clouds," remarked Collins. "It is strange that, although we are getting the wind from due east, that those clouds so near us and at the same altitude are moving north."

So saying, he turned the plane about. Without questioning his motive we continued to stare as we flew back to within a quarter of a mile of the clouds; then paused in a hover to watch their motions. To our surprise, we saw that they were no longer drifting. The erratic air current had released them and they were now motionless. Their surface no longer heaved and

pulsated as though with life. Only the long ribbons of exquisite cloud tracery, as delicately fashioned as the most intricate lace, still swayed and waved around the edges as though blown about by the wind.

"They are just ordinary clouds, after all," said Captain Price in disgust, "I thought we were about to discover some new meteorological marvel."

What Came from the Clouds

I DON'T know what made me gaze up into the blue just at that time—so remarkable are the coincidences of life—but I saw a dark object descending swiftly from thousands of feet above us. Down it came with incredible speed; and then, to my surprise, I saw that it was a large plane similar to our own.

"One of our boys has spotted us," I said, calling my companion's attention to the plane. But, to our amazement, this new arrival seemed not to have seen us, or he did not wish to make our acquaintance; for he came on down straight as a stone. At last he came to a hovering rest about two hundred yards from the strange-appearing clouds, which now seemed to turn back and merge with the dark background of vapor.

Suddenly something blinding flashed above the newcomer's plane, scintillated and flamed out like a large mirror in the sunlight, while spirals of blue fire ran along his wings and seemed to leap from them. We stared in wonder.

"Look! Look!" cried Price.

Following his startled gaze, we saw a large, white plane below the edge of the clouds go hurtling down to the sea.

"He dropped out of that cloud," said Collins in a low voice of awe. "And where's the cloud?" he added in bewilderment. "I'll swear it was there but a moment ago."

He was right. There were but three of the white clouds left, and they seemed about to be absorbed by the dark masses behind them.

"They have drifted into the other clouds," I explained.

The lieutenant shook his head.

"There goes another!" cried Captain Price, grabbing my arm in his excitement, just as I again saw that appalling flash of fire on the stranger's plane. But, even before the stricken plane struck the waves, I observed that another white cloud had completely disappeared. Before we had a chance to recover from our amazement, or to discuss the startling occurrence, we saw a third plane dart from the cloud bank out of control.

"At him!" I shouted wildly. "It is the 'blue demon,' and he is killing our friends. We will be next."

Before the words were out of my mouth, my pilots were driving the plane forward at terrific speed. At last we were to come to grips with the ruthless beast of the air that had eluded us so long. The remainder of our air forces would be saved and the darkest mystery that had ever stained our military record would be solved. But, as we rushed on, we were greatly alarmed and puzzled by the tactics of our strange enemy. For several moments he retreated; then paused as if in doubt, while his plane was bathed in a dazzling sheen of fire. Then, as we stared agape, he shot away with bewildering swiftness and melted into the clouds.

"He has beaten us!" gasped Captain Price. "Damn him!"

Chagrined and humiliated, we stopped in the edge of the clouds. We could not see ten yards into that black, rolling mass. We hesitated to penetrate its folds. However, we were given scant time to consider our problem. A cry of alarm from Lieutenant Collins drew my attention. Several hundred feet above us, and to the right about a hundred yards away, we saw another large, white plane, like the ones already sent down, emerge from the clouds and dart toward us like a shot. We gazed apprehensively—probably the same thought was in the mind of each—was this newcomer friend or foe? And then I saw that the fourth white cloud had disappeared.

Because of the sudden chill in the air we had closed the cabin. Every window, door and port was shut; but we watched the oncoming plane through the heavy, plate glass windows wondering whether to meet it in a spirit of friendship, to retreat or to give battle. It was a biplane, but of a pattern radically different from any we had ever seen. Its fuselage was extra large and swung low, and it carried two motors.

"Good Lord!" suddenly exclaimed Collins. "Look, everything is turning blue!"

We stared aghast. The air outside was swiftly assuming that deathly, terrifying hue that was associated with the "blue demon."

"Keep the cabin closed," I cried. "If that blue stuff gets in we are doomed. And—and—boys, the insulation works!" I added triumphantly. "Let's ram him!"

So we turned and darted toward the plane that by this time had reached our own level. I say darted, which should be the right word, for our motors and other machinery were functioning splendidly; but to our amazement and consternation, we were barely moving! Some great repellent force, like the blast of a gale, was holding us in check. In vain we tried to increase our speed, knowing that without it our foe held the advantage. Yet he was not firing at us. We saw no sign of life about the plane. The weapon he was using against us was the swift and silent one of electricity. But there was no flash or fire about the great white bird to indicate it—it was apparent only by that indistinct blue haze and the powerful agent that was retarding our flight. There seemed to be nothing to do but to turn back and retreat. Yet I knew by the stern, grim faces of my pilots that such a thing had not entered their minds.

They motioned me to the controls and aimed the forward machine-gun as we slowly forged ahead. At first our shots made no impression, neither did the foe retreat. But at last in the midst of the fierce rattle of the shots we saw the white plane quiver, bank suddenly and then go into a nose dive. We had scored a hit. But, after a drop of several hundred feet, she flattened out and darted south like a bullet.

"After him!" shouted Price.

And then we bent every energy to the chase. We were gratified that the force that had checked us had been removed and that, although the blue haze still surrounded our plane, we had recovered our normal speed. And our foe was mortal—we had wounded him—we had repelled his terrible ray, and he was running from us. However, it took us but a few minutes to discover that we had an adversary worthy of our steel, so far as speed was concerned. Save in our own planes I had never witnessed such rapid flight. Mile after mile the white plane held her own despite our most strenuous efforts. She flew due south, maintaining one level and not deviating a hair's breadth from her course.

"I'll bet they are making for South America," said Price. "I have seen many places along the Orinoco where an airplane base might be safely hidden. But wherever she leads we will follow," he added savagely.

"Amen," said Collins. "We will follow him and beat him to a frazzle, because our insulation renders us immune to his devilish ray."

The Men of the East

BUT our ambition to discover and destroy his base was doomed to disappointment. Before two hours had passed, the wind suddenly increased, assumed the proportions of a gale, shrieked about our ship, buffeting it and straining it in every fiber. Soon the whole heavens were black with storm-tossed clouds across which the lightning ran in vivid tongues of fire. The rain fell in torrents and, as a deep twilight settled about us, the sea was blotted out in the mist, and ahead we could see nothing but a gray wall of swirling rain.

Loudly cursing the weather, Price looked at me.

"I think we had better land," I said in answer to the question in his eyes. "We've lost track of the plane, anyhow, and it is not likely that we can pick it up again in this storm."

"Perhaps the scoundrels will go above it," suggested Lieutenant Collins.

"If they were not damaged they might," I said. "But, now that we are off their trail, I think they will take the opportunity to land on some desolate spot to make temporary repairs. We have made a good start today—we have met the 'blue demon' in actual combat and all but beaten him. Let us console ourselves with these facts. We will go toward shore, lay up for the night and perhaps to-morrow we may have better luck."

Accordingly we turned west, and in a half hour, flying low, we saw a flat, sandy island beneath us. On this we landed and made things snug for the night.

The storm continued for several hours, but the dawn broke clear. The wind had veered to the south, and now dying away, was breaking up the clouds above a tossing sea. Patches of blue sky showed at intervals and through a rift in the clouds we sailed up into the sunshine.

"Shall we go back home, or continue south for a spell in the hope that we may sight our quarry?" I asked.

"Let's keep on for another day at least," replied Price.

"I agree to that," said Collins.

As that was my notion also, we accordingly set our course south.

The clouds were breaking up rapidly. We sailed high above them, flying leisurely and keeping a sharp lookout for the white plane. Suddenly, through a break in the vapor, we saw it just above the sea. Its speed was much more leisurely than that of the day before.

"We will drop down and rip him open," said Price joyously: "We've got him this time."

Remembering the deadly blue ray, we closed every opening of the cabin as we began our dive. But we were not to have an easy victory. Hardly had we left the shelter of the clouds when he saw us, and made for the island we had just left. Once more that thin, blue haze surrounded us.

"Keep your damned rays to yourself," sneered Collins. "They don't bother us any."

It was true—we felt no discomfort—and this time the ray, or whatever it was, seemed to have lost its potency. It had not the power to seriously check our flight.

"Something mighty serious has happened to those birds," said Collins gleefully. "They've lost their pep and are sure our meat."

But the great white plane put on a sudden burst of speed, and at the same time our engine began to miss. We lost speed and the plane's nose dropped. We came up quickly, however, and once more got above our adversary and sprayed him with bullets from our machine guns. Again he out-maneuvered us and we missed. Captain Price cursed roundly as the beautiful white creature zoomed up out of reach. We saw their game—they would get above us and once more elude us among the clouds. But they were too slow. With all the tremendous force at our command we came up under them, tore into their fuselage and broke a wing. Then, as we drew swiftly back, the white plane, like a crippled bird, lurched drunkenly, then plunged, a whirling streak of white, to the ground. It landed in a clump of palmettos and burst into flame.

In a fever of haste and anxiety we landed near and hurried toward the burning plane, fearing that the fire would rob us of the fruits of our victory. I reached the plane, by extraordinary effort, just behind my pilots. The fire was roaring around the motors; evidently some of the gas pipes had burst in the crash. The cabin was badly shattered, and protruding half way through a broken window hung the body of a dark-skinned man. My companions pulled him from the wreckage, carried him aside and laid him under a palmetto. He was a handsome man with raven-black hair and jet black eyes; his features were finely molded and regular, his hands small but muscular with tapering fingers, his build athletic. A purple turban, its scarf awry, was on his head.

"Some high-caste oriental, or I'm a goat," exclaimed Price.

We stared at one another. Who could be our mysterious opponents?

In the cabin of the wreck, we found the body of another oriental, garbed like his comrade, but of shorter stature. A careful search revealed no sign of any other being about the craft.

All efforts to extinguish the fire with sand were useless. We could only stand back and watch it burn itself out; which it did when the petrol tanks were empty.

When at last the metal parts had cooled sufficiently to be handled we went about among them and examined them with care and awe. Despite the fact that the motors and the other machinery were blackened and warped, their rods, valves and dials broken and twisted by the intense heat, they presented an intricate maze of delicate and wonderful mechanical construction. We poked about among the mass, but the fire had destroyed the great secrets which we sought. We could not explain the functions of the ruined batteries and tanks, those queer-looking motors and pumps. We could not rearrange the severed wires. We could not reconstruct the melted mirrors, reflectors and transformers. Nor did a diligent search of the unburned portion of the plane reward us with a single document to help us in our problem; in fact there were no papers of any kind, no records or plans. Who were these men of the east? And by whom were they sent? Only a scant wardrobe and a little bedding were all that we found in the cabin.

"The damned assassins have covered their tracks well," snapped Price disgustedly. "Our victory is barren."

"In a degree, that is true," I acknowledged ruefully, "for this plane, as we witnessed in the skirmish yesterday, is but one of many—maybe thousands—hiding away somewhere awaiting a favorable time to strike

us. But of course we have made a little progress against the enemy; and we have uncovered two rays of hope, our planes are more than a match for them in battle, and it is evident that they are fighting among themselves."

My companions stared.

"The fight we saw yesterday seems to prove that," I went on: "The plane that got away from us in the clouds is a distorted copy of our own."

"That is so," agreed Price. "Evidently the two factions are jealous of each other. But, added to our other problems we have discovered another—complications with some foreign power."

"That will work itself out in time, I believe. But now we must set out for home."

CHAPTER IV
The Foe Invades Washington

WE got home without further adventures. Our report to the Air Department was held secret; not a word leaking out to the public.

For several days all was quiet. The weather was fair, business was good, and once more the people believed that the worst was over. Then, one day, in the midst of a storm, the enemy again struck. It happened over Washington above the Capitol itself. Six military planes which had not yet been insulated, winging their way home to Fort Myer, were suddenly attacked and destroyed. Their wrecks were strung along in a zigzag line extending from the Washington Monument beyond the Lincoln Memorial. Every man aboard them was killed; and every body bore that grisly blue mark of the mysterious slayer

The National Defence Council, assailed on all sides by a righteously indigant and suspicious public, and smarting under another bitter reminder of its impotency to stop the slaughter of its planes, assembled in extraordinary session. The atmosphere of the chamber was one of gloom and despair. My pilots and I were called in to recite the incidents of our battle with the foe.

"The theory of Captain Price, that this awful thing may have a base in South America, I think a sound one," said Commander Benson. "I believe that it would be well to send planes to scout in that region. Besides, I believe that our secret service should be doubled in every capital in the world. Although we have just witnessed another example of the demon's cunning and power, we feel that we are making some progress toward its annihilation. Mr. Clare and his pilots have demonstrated that the insulated planes are invulnerable to its attacks, and no plane so insulated has been destroyed. However, I feel that our progress toward the solution of this mighty problem is slow and that, unless we can hasten it, the price we will pay for our delay will stagger humanity. Therefore, I earnestly recommend that every available factory in the country be run night and day for the construction and insulation of military planes."

Commander Benson's recommendations were adopted without one dissenting voice. And then I asked for the privilege of conducting another night patrol off Boston; this was in obedience to a hunch rather than to any definite analyses. Not knowing when or where the demon would strike next, one patrol district would seem as likely to produce results as another. However, the startling sequence of events proved that sometimes a hunch may be right.

We took the air night after night, and nothing happened to us for a week; but in the meantime over the land we continued to lose planes—sometimes singly and other times whole flights. And then, one Sunday night, our luck turned.

The weather was magnificent. The full moon rode high, flooding the sea with silver as we swung out over it. The sky was clear, with only a few billowy clouds to freckle its velvety, star-strewn dome. Those clouds, which drifted lazily along in a light breeze, were scattered and irregular in size; but off to the right, only a few miles from shore, was a group of these foggy clouds, their white, fluffy banks and ridges standing clear and bright in the soft light. There were no others near them. They were of about the same size and shape; and, as we passed, I watched them curiously and counted them. There were seven.

We went on. For some time no one had spoken—doubtless every one was under the mystic spell of the mellow night. Then I noticed Price staring fixedly to the rear. Suddenly he rubbed his eyes and seized the binoculars.

"Look there, boys," he exclaimed a moment later. "I just counted those clouds when we passed—there were seven—*and now there are but four!* And—and—for the love of God, look! In their place are three white planes—the planes of the blue demon—and they are being attacked."

Unable to believe our eyes, we stared like fools. Above the three white planes had suddenly appeared, as though projected from empty space, the great craft that had escaped us before.

"There's our baby again," exclaimed Collins gleefully. "We've got him this time, or I'm a lubber." Then he swiftly turned the plane back.

And now, as we approached them, we saw that amazing blue fire blaze and flash and circle about the plane as it bore down on the white fleet. Then, one after another, the remaining four clouds vanished suddenly, leaving in their places *four more white planes!*

We stared at one another speechless with amazement. There were now seven white planes, each the exact counterpart of the one we had forced down on that sandy island. They had moved unseen within a mantle of clouds—and one of the great mysteries about our foe was solved. Under cover of their cloud screen they had approached their victims and struck them down by means of some infernal power.

"What dumbheads we all are!" I exclaimed in disgust. "Why didn't some fool among us discover that we lost no planes during clear weather—that clouds were always about?"

"But what about that fellow that seems to be all afire?" asked Price, "is he friend or foe? Foe, I'm thinking, for he ran from us. Probably he is the leader. And yet—"

The captain paused for want of words.

We came to a hovering stop less than five hundred yards from the white planes. Two of them suddenly nose-dived to the sea. Then, as the remaining five zoomed and dipped and banked in their mad efforts to escape the same fate, their aggressor gained altitude with a swift, upward surge. He quickly wheeled to the left and brought all five white planes upon his quarter. Again his plane blazed with blue and green and yellow fire; and three more of the white planes, whose cloud curtain had been mysteriously dissolved, went lurching down and were swallowed by the waves!

And now we were surprised to see the two remaining planes, unmindful of the awful power flashing from their adversary, charge straight at him. But, before

they were fairly under way one of them began to wobble; then it dove straight into the air, only to drop back in a moment in a tail-spin to the sea.

It now became a death struggle between the remaining white plane and its terrible antagonist. Still hovering there inactive, not knowing who was friend or foe, if either, and expecting to be attacked by the victor, we stared silently at the remarkable battle. In some strange manner the white plane, although now the center of the aggressor's attack, managed to parry his fiery thrusts and to return again and again to the attack. For the first time we noticed a pale, blue ray dart intermittently from the cabin of the white plane. Then we suddenly realized that its great foe had been hard hit; no longer the fire flashed from its wings and fuselage. It began to retreat at an upward angle before the thrusts of its enemy. Three times it returned and attempted to ram the white plane, which always eluded it. But we could see that the white plane also was badly crippled. Its movements had become slower and they lacked their usual skill.

Suddenly the big plane drew away from its white foe. It rose higher and higher with a slow, unsteady motion, while we followed at a distance, and the white plane kept climbing and circling after it a hundred yards below it. Then, to our utter amazement, we saw a man emerge from the cabin of the upper plane, walk out upon a wing and pause there, staring down at his enemy. A blue smoke was issuing from the fuselage behind him, and the whole plane was trembling and swaying as if about to fall. The man was without a parachute, and we wondered what he had in mind as he continued to gaze down at the circling plane. Why the latter did not finish him off as he stood there, a fair and open target, we could not imagine. But likely its pilots were hard pressed to keep the plane in the air.

An Astounding Discovery

THE white plane still circled closer in its narrowing orbit, passing directly under the man on the wing. Suddenly we saw him gather himself for a spring.

"My God, he is going to jump!" I cried aghast. "He is going to leap to the other plane!"

Then as we stared in dumb and silent awe he sprang into the air. Straight down he plunged, and he had gauged the plane's motion well, for he alighted squarely on his feet in the center of its wing. He swung himself down to the cabin and entered by an open door. A few hoarse cries reached us, mingled with the clank of metal striking metal, then all was silence. But in a moment the plane staggered into a nose dive. For a thousand feet it dove as we followed after, and we thought that it was surely about to crash into the sea. Yet, after a moment, it flattened out and turned toward the land.

A sudden mighty rush of air now thrust us aside, and the great plane which had just been abandoned, careening madly from side to side, rushed past us and buried itself in the ocean. Intent on watching the white plane, we had forgotten it momentarily and came near being crushed by it.

Meanwhile, the crippled white plane, paying no attention to us, was painfully making its way toward the land, with crazy, uncertain glides. It was evident that its navigator was nearly spent and was seeking a haven of refuge on land. At last he reached the shore, just grazing the top of the cliffs, and came to a crushing stop in a stony field a quarter of a mile inland.

As soon as possible, we landed by the side of the wrecked plane and rushed forward. The first human figures we saw were two turbaned orientals, dressed like the two we had vanquished. One glance and we saw that both were dead. Each had a smile of devilish defiance on his dark face, a smile of haughtiness and disdain, and their wide-open staring eyes held no shadow of fear. Hurriedly we looked for their intrepid conqueror. Then we saw him lying on his face, wedged in between the pilot's seat and the instrument board where he doubtless had fallen when the plane struck. Blood was flowing freely from a wound on his head, but he was breathing. Collins and Price pulled him out and laid him on the ground beside the cabin. And then as I bent over him my senses reeled drunkenly, and for a moment I doubted the evidence of my eyes. For I was gazing at the rugged, honest face of Lon Grand!

"Good God, boys!" I gasped. "This is my long-lost friend! This is Lon Grand!"

They stared at me incredulously.

"He was fighting our battles," said Price at last, "and to think that just a short time ago we were trying to send him down to Davy Jones!"

"We must get him to a hospital at once," said the ever-ready and resourceful Collins as he knelt to bind his handkerchief about Lon's bleeding head. "Price," he continued, placing his hands beneath Lon's shoulders, "you take his feet."

We soon had Lon aboard our plane, then as the excited natives of the locality ran up, we shot into the air and headed for Portsmouth, the site of the nearest hospital. On the way we radioed to the Air Department to secure the wrecked plane.

It took heroic work to save Lon's life; although he had no severe wounds or injuries save that on his head. For weeks he lay in a coma; but at last science and tender nursing prevailed and he came out of the shadows—came from under the mental cloud that had possessed him so long. Calm reason without a glint of fear, doubt or uncertainty, now glowed in his splendid eyes. Doubtless the blow he had received in that last mad fight had proved his mental salvation.

Day after day and often far into the night I had sat by his bedside praying that his life be spared. I left the work of the air patrol to others. But it was now without particular interest, for the attacks of the "blue demon" had entirely ceased. But so frail was Lon's hold on life, and so fearful were the doctors that any sudden excitement might again unbalance his mind, that it was another month before I was allowed to reveal myself to him and ask him to tell his story.

"It is but a simple tale, Clare," he said modestly as he gazed fondly into my eyes. I sat by his wheel-chair holding his hand in a warm clasp. "I am sorry that I have been unable to tell it to you sooner for now it may be too late unless—" He paused and looked at me with a whimsical smile. "Unless your insulated plane has turned the trick," he finished.

"You have turned the trick yourself, Lon," I said warmly. "You alone saved us, but we are just dying to know how you have wrought this miracle. We have lost no more planes since that last heroic battle of yours. I reckon the 'blue demon' is sleeping."

"The blue demon," repeated Lon reflectively: "Well, the name is appropriate enough. But I can't understand why they have let up in their attacks. Still, there are many other things about this strange enemy of ours that I can't understand. One thing I do not positively know—its identity. Think of it—I who have lived among the conspirators, supped and slept with

them—cannot with certainty name their nation. So I leave the enigma for each man to form his own opinion.

"To go back to the beginning," resumed Lon after a pause, "we all know how the invention of your plane completely vanquished our enemies from the east. Beaten and humiliated, it was natural for them to attempt to learn the secret of its construction. But the ironclad discipline of our government's air forces prevented this. You know, old pal, how I wandered away from you in the clutch of one of my queer spells before the war was over. This time my aberration must have lasted for weeks and months. I can recall only hazy glimmerings of my life and actions for some time. I do not know just what happened to me, but I must have been drugged and kidnapped.

"When at last my senses returned in a measure, I found myself in a wild, mountainous country containing dense forests and great, level plains. I was surprised to find that my companions were orientals belonging to a proud and ancient caste now banished by their government. I was treated graciously, housed in comfortable quarters and given to understand that they were my friends. Then came the great surprise. Their head man, a rajah, tall and proud and powerful, came to see me. He informed me bluntly that, since I knew the secrets of my country's great airplane, I was to reveal it to him and to assist him and his followers in the building of planes like it. He also politely gave me to understand that, unless this information were forthcoming within a reasonable time, my life was to pay the forfeit.

"Well, I begged for time to consider this startling proposition; and while debating it I was allowed to roam around at will. Then it was that I made some astounding discoveries.

"The little valley where I was held a prisoner harbored a town of several thousand people, and in its center, ready for operation, was an airplane factory in which the whole population was expected to work. I discovered that this was an inaccessible region in the north of India, unknown to the outside world and seldom visited. It was presided over by this rajah who, I take it, was a sort of social outcast from his particular caste. He was a merciless despot; but everybody there seemed to worship him and worked uncomplainingly under his iron rule. Hazy as my mind was, I gathered that this worthy was in the pay and confidence of some powerful eastern nation, and that he was to turn the new planes, when finished, over to it. Thus this power, while presenting a friendly face to the United States, was secretly planning its destruction.

"At last I pretended to fall in with their plan, but under one subterfuge and another I delayed the work. I didn't know what to do; but I was determined to sacrifice my life rather than betray my country. But I wanted to live, gain the secrets of this strange band of men and aid in preserving my country. Fate helped to solve my problem. One evening just at twilight while returning alone from a stroll in the valley I saved from assassins the life of a young oriental of good breeding, education and intelligence. A low-caste laborer, for some fancied injury, was about to stab him to the heart when I stepped between them, receiving a flesh wound in my own chest. The young man, Relgoon by name, from that time on was my friend. So to him I gradually imparted my desire to outwit my captors, to escape and to reveal their secrets to my government. He agreed readily to aid me, and with a solemn oath pledged his life to my cause.

"At last, a model of one of our super-planes was started. I built it as near like ours as I could remember; but I introduced some changes. The plane was hardly under way when we were visited by a fleet of beautiful white planes, all manned by members of the band. I was taken on board one of the planes and given a ride in the air. I was frankly told that these planes possessed some remarkable features, far superior to the American planes which they wished me to study and incorporate in the plane I was building. I was shown the apparatus of the invisible death ray they carried, which was capable of killing a man at the distance of two thousand yards, which could be intensified and directed at a minute target.

"Most astounding of all, they possessed a devilish contrivance to screen their movements. This was a machine for generating a fog cloud which they could keep about them as they sailed and in which they could lie concealed for hours, especially when blended with the real clouds of the sky. Yet through this cloud they could send their ray, directing it by means of some hellish electric eyes which I was never able to discover and copy—my old think-box functions but poorly at times.

"Now Relgoon and I, working hand in hand, set out not only to equal these damnable instruments, but also to improve and surpass them. You know, old scout, that I have always been quite apt in the field of electromagnetism. So, while neglecting to build a cloud creator in the new plane—giving as my reason that owing to the plane's peculiar construction it would be best to install it the very last thing—and remembering that one of the most obstinate elements menacing the safety and navigation of all planes is fog, we created a fog dissolver.

"When the plane was ready for the air, but still incomplete in equipment, I invited the rajah and several of his officers aboard and we went for a trial flight. The plane surpassed all my calculations. It behaved superbly, responding to all maneuvers with marvelous speed and precision. The rajah was delighted. He rubbed his hands together in glee, I fancy in anticipation of some nation's gold that was soon to cross his palm. While he was in this good humor I disclosed my new dissolver, casually reminding him that fog was one of the most troublesome and dangerous of the obstacles of aviation. I desired to try out the invention, and if successful, to install it on our new planes. He was favorably impressed with the idea, and by radio he ordered one of the white planes to approach us shrouded in its cloud mantle, little dreaming that I was negotiating the collapse of his golden dream.

"In due time the plane appeared in its glorious white cloud. I pointed the dissolver, and lo, its fog was shattered and the plane revealed in a twinkling. Nor could the plane again build up its cloud under the attack of my rays.

"The rajah was prodigal in his praise as we returned to town. He was immensely gratified that my work had merged without friction into all his plans. I was given more freedom and was accorded every honor that the little band possessed.

The Escape

"AT last the plane was complete, even to the introduction of the projector which sends out the ray with its poisoning power and its peculiar hue. But, like a fool, at the last minute I neglected to install the fog producer; I was in such a big hurry to get away. Secretly, bit by bit, Relgoon and I provisioned the plane

and made it ready for a long voyage. Then, during one dark night of rain and wind, when the sentinels had sought shelter from the storm, while the few lights of the city blinked dimly through the mist and the people of the town were asleep, we stole over to the hangar, doped and bound the guards, ran out the plane and zoomed up through the rain.

"We made but little headway during the night; but by morning, the storm having lifted, we sailed out over the Pacific. Cruising along the islands of Japan we encountered heavy fog banks, but by means of our dissolver, which cut a clear path through the vapor fifty yards wide and about five hundred yards long, we sailed through it easily without slackening speed.

"Three days later we landed among the cactus of Northern Mexico, because we were forced down by motor trouble. To avoid arousing the suspicion of the natives and being subjected to unpleasant questioning, we represented ourselves as United States military aviators. But owing to the remoteness of the region and the indolence and the red tape of the officials it was over a month before we were repaired and again took the air. Then we were stunned to learn of Colonel Brandon's sad fate. I saw how it was—the mysterious eastern power, learning of our escape and fearing that we would soon warn our country, had determined to rely on the prowess of their own devilish contraptions and destroy our planes one by one before they could be warned.

"Why I did not immediately reveal myself and my plane to the proper authorities is one of the great puzzles of my mental illness. I was aflame with indignation and hate against this sneaking, unseen foe of my country, which I can not even name. And Relgoon shared my hatred. So, immediately we set out to hunt and destroy these white planes which, though deprived of our inventions, had nevertheless set out to destroy us. But we had a great advantage unknown to the enemy. Secretly I had greatly increased the power of the ray and added other little tricks that were sure to help us.

"I had an obsession to locate the base of those white devils and lead our planes upon them. But there were delays; we had hard work to keep from being discovered, to get supplies and find a snug haven for our plane. And, in the meantime, our planes were being destroyed. Yet I hesitated to make myself known. My wayward mind kept suggesting that I first locate the enemy's base. But so cleverly is that base concealed that only a few days before my last fight did we discover it. And then, I regret to say, my faithful Relgoon lost his life. You will find that base in a cove of Pamlico Sound where a good-sized stream empties into the cove, its mouth hidden by low, overhanging live oaks heavily covered with festoons of Spanish moss. Here is the entrance to the invaders' haven. This haven is never entered or left by the planes save at night and then under cover of their clouds. It is not a mechanical base—only a few supplies are kept, and their gas is supplied by night-prowling launches with crews in the pay of this unknown power. Go at once, I beg of you, and destroy this outer harbor of hell."

Lon sank back exhausted and closed his eyes.

Within an hour preparations were going forward to descend on this base of the terrible white planes. And, before nightfall, a fleet comprising the cream of our insulated military planes took off for the south.

I need only to add that the base was found abandoned. Our subtle enemy of the East, whoever it might have been, doubtless cowed and alarmed by Lon's heroic battle and the impregnability of the insulated planes, and convinced that the game was up, had ceased its operations utterly.

As Lon and his companion had left the mountain rendezvous in India at night he was never able to locate it again. So no further particulars of this international outrage were ever learned.

But the great work of my friend Lon Grand, now fully recovered and hale and hearty in the mellow years of mid-life, goes steadily forward. Today he is one of the world's leading aviation engineers.

THE END

WHAT IS YOUR KNOWLEDGE OF AVIATION?

Test Yourself by This Questionnaire

THE questions given below are taken from the stories in this issue. They will serve, by your ability to answer them, to test yourself in your knowledge of aviation. By thus testing yourself, you will be able to fix in your mind a number of important facts of aviation that are presented by the stories.

The pages, on which the answers are given, follow each question.

1—Of what may clouds be composed? (Page 491)

2—Should condensation of vapor take place with a stationary reading of the barometer? (Page 491)

3—What is one of the most obstinate elements that menaces safety and navigation of planes? (Page 496)

4—How could one in an aircraft arrange to see in all six directions at once? (Page 544)

5—What is the name given to a plane which is supposed to rise vertically? (Page 531)

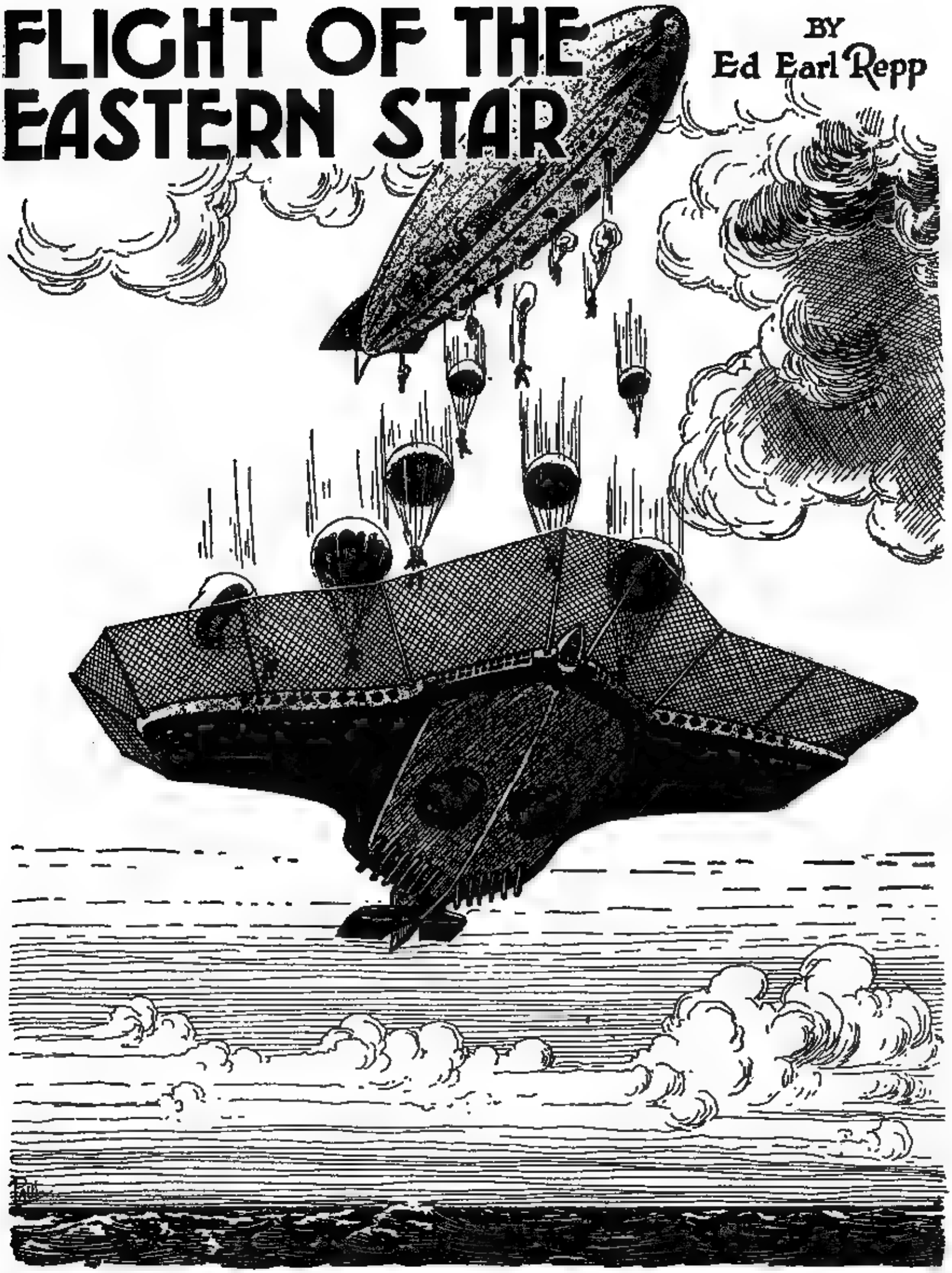
6—What happens to one's calendar as he goes west over the International Date Line? (Page 499)

7—What might be the advantage of giving a dirigible wings? (Page 509)

8—What is the cause of lightning? (Page 511)

FLIGHT OF THE EASTERN STAR

BY
Ed Earl Repp



(Illustration by Paul)

Almost at once I saw a long stream of rapidly falling dots. Then the nearest had his plunge checked, as a gossamer-white balloon of silk opened, then another bulged, and then another.. I wondered if they would land safely on the broad hull of the *Eastern Star*.

FLIGHT OF THE EASTERN STAR

By the Author of "Beyond Gravity," "The Stellar Missile," "The Radium Pool," etc.

FOR many years I had planned to fly around the world in one of the gigantic International Airway Express liners; but not until recently had I been able to adjust my affairs so that they would not require my personal attention for a few weeks at least. However, during the years, there had appeared safer and speedier aero-transportation. So, when I was ready to make the flight, I felt assured of a passage, not only with the utmost safety, but also with the maximum of comfort. The International Airway Express Company had even abandoned many of its huge landing fields, and adopted instead towering pylon-like structures to which their leviathans of the air were anchored by an application of electromagnetism.

ED EARL REPP

I was fortunate indeed in having booked passage on the great *Eastern Star;* for, if I had not, I would have missed the thrilling episodes that followed. The novel features of the great craft, many of them revolutionary, added to the excitement of being able to fly on her maiden trip. I was eager to be off and, an hour before her scheduled arrival from the east, I was in the Los Angeles station at the base of the anchoring pylon located in the center of the Plaza. This historical spot in the center of old Los Angeles had been purchased by the International Airway Express Company in 1950; but not until recently had the space been utilized as the location for the anchoring towers.

On arriving at the station, I went at once to the office of the Pacific Coast manager of the company, Jackson Worthington, my former college chum. As I entered, he was seated at his desk, staring into a large luminous screen which was placed at a convenient angle before him. He glanced up.

"Hello, Tom!" he said, rising to grasp my hand. I had not seen Jack for several years and at once I noted that his temples were grayer and new lines on his pleasant features told more eloquently than words the responsibility of his job. "I see you're listed as a passenger. Why didn't you come to me for your reservation? How are you anyhow, you old——"

"I feel the need of excitement, Jack," I cut in, wringing his hand heartily: "I didn't think it necessary to cause you a lot of inconvenience, so I had my secretary book my passage. Outside of overwork, I'm as fit as I was when we put it over Gayle. Remember it, Jack?"

His eyes sparkled as he motioned me to a chair.

"Do I?" he ejaculated, smiling reminiscently: "That was the game that made history for Bingham. I still carry the scars of that battle! I could have murdered that big brute of a half-back for spiking me!"

"It was a dirty trick, all right," I acknowledged, remembering vividly the incident; a Gayle player many years before had spiked Jack in the side in an effort to put our star out of the game. "But it's all in the game. You've got to expect slams in almost everything."

"I suppose so!" he said, seriously: "But what the devil made you decide on a trip around the world? Business or pleasure?"

"Pleasure, Jack, old boy," I answered, handing him a cigar of my private brand: "I'm getting stale, and I want to make the flight before I'm too old. I've only had three trips to Europe and one to Hawaii; and I couldn't enjoy 'em because there was too much business to occupy my mind. Now I've managed to clean things up a bit; so that I have nothing to worry about for a while."

"Well, I'll change your reservation for you, Tom," he said, laying a hand on my knee: "A bachelor like you will want to fly in comfort. I had a chance to take back the No. 1 cabin on the *Eastern Star;* it's yours now if you want it. You'll be well up forward, and I'll arrange with Captain Markson to show you everything. You won't be lonesome, and I assure you that there's a thrill in every mile."

"What kind of a ship is this *Eastern Star,* Jack?" I inquired: "I don't recall that I've ever seen the pictures of her."

"First class, ultra-modern airliner, Tom," he answered with pride in his voice: "She's the finest airship ever built and the fastest. You leave Los Angeles at six o'clock this afternoon; you are in Tokio at ten tomorrow night, even after losing twenty-four hours by the change at the Date Line. I suppose you'll want stop-over privileges?"

"That's fine, Jack!" I said: "Yes, I'd like to stop in London for a few days. You see, I intended to be away for about fifteen days in all; but I'm allowing myself three weeks, in event of any unforeseen delays."

IF the old Romans could come back and compare their galleys with the present trans-Atlantic greyhounds of some 60,000 tons capacity, they probably could not believe their own eyes.

So we of today, looking at our great airplanes, find it difficult to realize how puny they will seem when compared with the aircraft of the future.

There is no question that the future airliner will be as big as our biggest ocean greyhound of today: and even bigger, when the secrets of aero-dynamics, aerial navigation and all that goes with them have been mastered.

With such a future realized our well-known author has recounted an exciting voyage of a great airliner.

To be sure, an ocean voyage on a steamer is a prosaic affair today; but every once in a while we have miraculous adventures—such as when the "President Roosevelt" saved the crew of a freighter during a storm in mid-ocean.

You will find plenty of such excitement and adventure in our author's latest effort.

The Position Locator

A BUZZER sounded somewhere under his desk. Worthington

turned to regard the illuminated screen; my eyes followed his and I beheld, on the surface of the oblong device, hundreds of tiny moving specks. I leaned forward to observe them closely; the specks were the locations of aircraft in flight! I was astonished, and regarded the screen with curiosity. I saw the familiar coast lines of the United States. Canada, at the north, loomed almost solid, except for the occasional hair-like lines that revealed her rivers; the Great Lakes fairly glistened. Gazing toward the east, I beheld the rugged coast line of Maine. Then an area which seemed fairly liquid stood between the Atlantic seaboard of the United States and the British Isles, to represent the Atlantic Ocean. Here and there, over the land and water shadings, were the tiny specks that revealed the exact locations of every aircraft in flight over the territory exposed on the uncanny screen.

Jack Worthington regarded their movements for an instant, and with a finger he traced the forward motion of a small speck. It seemed to glow intermittently, as though signalling by flash. He grasped a small disc-like object from a hook and placed it to his ear; with his free hand he pulled closer to him another small round object that stood on a low pedestal. I continued to watch the flashing of the dot on the screen.

"Los Angeles talking," he said into the instrument: "What's wrong, *Eastern Star*?"

There was a brief pause and I allowed my gaze to wander to the features of my friend.

"Forty-five minutes' delay!" Jack Worthington said: "How come?"

Another pause:

"Rocky Mountain updraft, eh?" said Jack, frowning: "Well, you can make up the lost time from Los Angeles west. Tell Captain Markson that the company won't tolerate too many delays. All ships coming west will have to swing off the regular route east of Denver and come around the up-draft. Your route is dangerous and the delays are costly."

He swung his swivel chair around and faced me again. His features seemed sober and serious.

"That damned Rocky Mountain up-draft causes us more trouble than all the air-pockets from here to Japan, Tom," he said, shaking his head: "Some days, the atmosphere over the Colorado peaks are as free from up or down suctions as the air is over Los Angeles. On other occasions, aircraft are sucked into them and are drawn either upward or downward. There's no way of foretelling what sort of atmospheric movements are going on in that region."

"Why doesn't the company re-route the course, then?" I asked abstractedly.

"Because our franchise permits us only ten miles leeway on either side of our regulated airlane," he replied: "Every time we swung off that course, the Occidental people on one side of us and the Trans-Continental company on the other make a kick to the Federal Aviation Commission against us for violating their franchises. It's enough to cause a man to go insane, trying to figure out just how to keep our passengers and ships in safety when they reach the treacherous air-stream regions!"

"That's quite an instrument you have there, Jack," I said, nodding at the screen.

"International holds all patents to that position locator," he said: "It is somewhat of an invention, although little has yet been said about it. On it we can locate every one of our ships in the air, no matter where they are. If rival ships are equipped with low-wave detectors we can also spot their positions. Each one of our ships broadcasts continuously on private wavelengths by noctotelevision, which gives us their location over any part of the globe. We have ships in the air practically everywhere, you know, and with our own detector we can get the location of every ship in half the world at a time."

He faced the instrument again and twisted a small dial on a panel underneath the screen. Its glow died for an instant and then across it flashed a new map.

"There," he said with finality, "you see the other side of the globe, from Los Angeles to Cairo. Here's the Hawaiian Islands; farther west is the Orient, Japan here and China there. Further on there is Manchuria; Siberia and Russia over there. These white dots are International Airway Express ships; while all others belong to rival companies. See the immensity of the Pacific, Tom. Even looking at this makes you think of her beauty. Do you know that the old Pacific is very much like some of our modern types of women?"

"How's that, Jack?" I asked with a grin: "I know very little about women."

"Beautiful but treacherous!" he answered with a laugh: "She's the siren of all water bodies but, like woman, she is necessary to man. We can't keep away from the Pacific, despite the fact that more ships have been lost on her than all the other oceans put together. Once lost in the Pacific, you are lost indeed. We know that up-drafts and down-drafts exist over the Rockies; but we can never tell what's going to pop up over the Pacific. Yet International has been fortunate in combating these unseen obstacles in later years. I've often wondered what becomes of the aircraft lost over the Pacific."

"Perhaps some day we'll find out, Jack," I said with a trace of alarm: "You don't suppose there's any chance of the *Eastern Star*——"

Jack Worthington patted my knee and laughed.

"None in the world, Tom," he replied. "You needn't have any fear of a ship like the *Eastern Star* getting lost. I didn't mean to cause you any apprehension with my ponderings. Forget it and enjoy your flight. There's nothing to worry about. The *Eastern Star* has gone through the most exacting tests."

The Captain Explains

JACKSON WORTHINGTON was always the personification of kindness. Whether the fact that we had been college chums made any difference, I do not know; but he arranged for me to see everything. And, as we waited for the *Eastern Star* to loom into view, each passing minute served to increase my impatience at the delay. I wanted to be off—— I was as anxious to be away from the scenes of my brain-killing business as a youngster waiting for vacation time.

After half an hour of waiting, I was becoming ill-humored. I stared about the waiting room on the ground level just under the anchoring pylon and, for the tenth time, I noticed the two elevators which nestled in a corner, ready to take their loads of passengers upward some six hundred feet. I glared with baleful eyes at a small, pale man, the announcer, who sat at a switchboard near an open exposure, fingering a row of push-buttons. Frequently he gazed through the window at the sky exposed before him and I could tell by the impatient look on his wizened features that the *Eastern Star* had not yet put in her appearance. Somehow, I had a baseless feeling that he alone was to blame for the delay of the air leviathan and added to the fact that I strangely disliked his looks. I felt

almost like grabbing him by the collar and casting him through the window. I was angry at the ship's delay, angry and ill-humored at the beginning of the adventure. I suppose my days of bachelorhood had created within me a certain temperament that could be satisfied only by instantaneous compliance with my wishes.

Suddenly the little man spoke into a tube, and the room reverberated with the rasping sound of his amplified voice:

"*Eastern Star*, forty-five minutes late, is now nosing down to anchor. Passengers will deposit their hand baggage with the checker for delivery on board the liner. The *Eastern Star* will take off in exactly eighteen minutes. Tokio first landing! All aboard!"

There was a sudden scramble toward the elevators. At a signal from the operators, the little man pressed a button on his keyboard and the doors closed; the lifts were moving upward rapidly. I shot a glance toward the station's great windows; a deep shadow was darkening the space, and I felt a slight jar as the huge ship's nose came into contact with the electromagnetic plates which drew her downward to anchor. My ship had arrived at last; but I waited on the ground for Jack Worthington until the rush for the elevators had ceased; though I was anxious to see the surface appearance of the *Eastern Star*.

Presently Jack ushered me to one of the lifts; at once we were wafted upward and deposited on the closed platform. A ship's officer was waiting on the landing, glancing nervously at his wrist watch. He looked up and bowed to Jack Worthington, who was mumbling something to himself about the expense of a forty-five-minute delay. Far below, the din of busy city life clanged irritatingly in my ears; even though the sound was muffled by the enclosure. There was the clatter and scraping of baggage, as the two-score handlers lifted it from the express elevators and shot it down into the liner over bearinged ramps and through compressed-air chutes. Then, as I understood, it would be sorted out in the ship and labeled according to its destination — Tokio, Peiping, Nanking, Calcutta and other points.

Captain Markson, a rather large, muscular man with gray hair and steady blue eyes, appeared and addressed my friend.

"I'm mighty sorry, Mr. Worthington," he said seriously, but with a trace of nervousness in his manner: "But I think I can make up that forty-five minutes, once I get up in the rarefied-air regions."

"Of course you can, Captain," Jack replied, smiling with a lightness that I knew was forced. "What happened to you over the Rockies?"

"We were cruising along at our regular clip," the captain explained, "when we ran head on into an up-draft, some miles east of their usual area; I hadn't expected a suction-stream so far east. I was in for it before I knew; but we managed to fight out of it without any damage, although about half the passengers are almost nervous wrecks. There's a lot of old women on board, you know; mostly school teachers from the Middle West, wanting to see the Orient from the air. Anyhow, the up-draft was not as severe as some I have encountered in the past; but it took forty-five minutes of steady fighting to keep from being lifted beyond our altitude limit, and get out of it."

"There must be quite a blow over the Rockies, Captain?" I put in.

"Worse than an ordinary blow, sir," he replied, positively. "There's no comparison between an up- or down-draft and a blow."

"This is my friend, Mr. Rodman, Captain Markson," Jack said by way of introduction: "Take care of him aboard. Show him everything and give him the run of the ship."

Captain Markson grasped my hand tightly and wrung it with friendly warmth.

"Glad to have you along, Mr. Rodman," he said: "I'm sure you will enjoy the flight. There's everything on the *Eastern Star* that is needed to keep a man comfortable and happy."

"Any fascinating widows aboard, Captain Markson?" asked Jack slyly and glancing my way. I felt my cheeks burn. Jack Worthington winked and the captain nodded pleasantly.

"I repeat that the *Eastern Star* boasts of everything required to keep a man happy," he said, smiling.

"Just the same, gentlemen," I replied, feeling somewhat nervous at the thought of enforced association with nervous females of uncertain age: "I don't think I'll be much interested in your lady passengers. I'll stick with the officers, since I may."

CHAPTER II
The "Eastern Star"

MY friend laughed loudly; he then turned to the captain and addressed him seriously.

"There's a valuable consignment of gold bullion being put aboard, Captain Markson," he said in a low tone: "It *must* be delivered at Peiping by 9:00 A. M., local time, Thursday. If you fail in making delivery by that hour, the company will lose the $100,000 guarantee which we have given against delay."

"Don't worry, Mr. Worthington," the captain replied: "We'll arrive in Peiping hours before that. The bullion will be delivered on time."

A uniformed officer brought the ship's clearance papers. The captain glanced at his chronometer, impatient to be off; then he turned to his superior.

"Does anyone know about the consignment, Mr. Worthington?" he asked.

"None but the shippers, the consignees and the three of us, Captain," Jack replied. "Why?"

"Oh, I just wondered if there were any chance of a raid upon the gold," the captain returned: "Well—there won't be any up-drafts to delay us between here and Peiping, sir. We'll make it in plenty of time. I'll let you know of anything unforeseen. Good-bye, Mr. Worthington. We'll take good care of your friend."

"He'll take care of himself well enough if you allow him, Captain," Jack said, nodding.

"Never had a nurse, male or female, in all my life, Jack," I grinned. "I can get along all right providing the captain gives me a bodyguard to keep his foot-loose schoolma'ams away from me."

"Then you stick close to First Officer Madden, and the women will let you alone," Jack said, good-humoredly: "He's got the ugliest face in the whole universe; but he's a better sport than a dozen average men put together, even though he's not a ladies' man."

"That's about right, gentlemen," Captain Markson laughed: "You'll be safe with Madden. *Adios*, Mr. Worthington."

"Good-bye, Captain," Jack replied, and turned to me: "Let me know if any of the men or officers on the *Eastern Star* fail to treat you right. I'll fire 'em on the spot. And see if you can't walk some of that paunch off you"—he poked me playfully—"Have a good time, Tom. Be sure to see me when you get back."

A gong clanged somewhere in the interior of the *Eastern Star*. I stepped down the passageway leading into the craft from the platform. Captain Markson followed close behind. He pressed a signal button as he entered the open side of the ship; and I heard some unseen machinery hum softly. I glanced back in time to see two heavy steel doors sliding together; there was a soft snap as they locked tightly.

The interior of the ship where I stood beside Captain Markson seemed to be an arched passageway; the walls were spotlessly enamelled and the floor thickly carpeted. The captain led me well toward the center and paused before a row of small elevators, one of which soon whisked us upward to the main deck. I was surprised at the luxury manifest in the decorations of the *Eastern Star*. On every hand stood massive divans, upholstered chairs, thick, oaken tables finished beautifully; the walls were adorned with paintings and tapestry. No great hotel was more lavishly decorated than this expansive salon before me. I was elated; for here was comfort indeed.

The salon seemed strangely vacant, however; and I presumed that, somewhere in the ship, there must be a deck from which passengers could look down to earth and wave *adieu* to their loved ones as the craft moved away from her anchoring pylon. But, before I could inquire of Captain Markson if there were such an eyrie, he addressed me:

"Would you like to come up into the control room to watch the take-off, Mr. Rodman?" he asked. "We cast off in another minute."

"You bet, Captain!" I said: "I'd like to watch it."

I followed him out of the reception cabin, along a well-lighted and roomy passageway, toward the nose of the ship. We went up a flight of carpeted stairs and entered a large, circular room, over which seemed to be a dome of thick, transparent glass. A dozen uniformed officers stood at various posts in the combination bridge and control room. A man wearing a braided visor stepped forward and saluted snappily:

"All ready, Captain!" he said. "What orders, sir?"

"Signal the ground man to break the magnetic contact, Madden," Captain Markson said, crisply: "Start the electromagnetic power distributors for the usual vertical take-off. Rise to 2,000 feet and set the course indicator at 30-30-2."

"Very good, sir!" Madden turned to a control panel.

I was not disappointed in Madden's famous visage. It is no injustice to a gallant officer to say that he is indisputably ugly; though it is only an uncouthness of features. For, to offset it, the pleasant twinkle in his pale eyes seems to compensate whatever natural antipathy the unusual set of his features aroused. He is not repellent, mind you. He has an odd personality to make him respected by a man, if not admired by the gentler sex. And, as I learned to know the man in the later hours of the flight, I found that he is an excellent officer, a fine navigator and—as Jack Worthington had said—a good sport. Should I ever need a friend in a pinch, a real man in a tight place, I will select Madden to stand by me in place of a score of those loose-lipped, Apollo-faced gentleman of the ballroom variety.

The Near-Catastrophe

IT was Madden who was first at the control when the unexpected thing occurred; and it was Madden who brought the *Eastern Star* to an even keel when her nose suddenly dipped earthward under the pressure of her driving exhausts. Just how the near-catastrophe happened, when the ship cast herself free from the anchoring tower, I do not know; although I learned later that one of the four pilots had neglected to test the elevators to make sure that they were in position for upward flight. As the result of this negligence, before the *Eastern Star* had risen to the necessary 2,000-foot level, her nose shot earthward at a terrific clip under the power of her exhausts. I was thrown into a corner by the abrupt dive of the ship as her tail lifted skyward. I had one glance through the observation windows of the control cabin and saw the earth rushing up rapidly. Then I caught sight of Madden, who—with a bound like the spring of a panther at a victim—leaped aside and grasped a reserve elevation-control wheel.

The *Eastern Star's* nose missed the tops of the buildings by inches, rather than feet. Then, with a force that caused her interior bracing girders to groan under the pressure of a sudden upward thrust, it swung up; while her keel grazed a spire opposite the Plaza. The ship seemed to leap into the air almost perpendicularly.

With my arms locked around a rigid, stationary pilot chair, I clung in this precarious position to prevent myself from being hurled to the far end of the cabin; it was like hanging by the arms from a horizontal bar, legs dangling. Fearfully, I glanced upward. Frantic officers were clinging to various handholds, struggling to maintain equilibrium. Only Madden seemed cool, as he stood braced at the chair to which I clung. I could not see his face, yet I felt that, if the ship should escape total destruction and those on board and in her path below be spared, then Madden alone could be thanked.

I saw him loosen a foot from its anchor around the chair. His boot scraped on the metallic floor as it sought a signal pedal to increase the power of the driving exhausts which, I was to learn, propelled the *Eastern Star*. With a jerk the huge air leviathan leaped upward, skimming the roof of the rebuilt Hall of Justice. Simultaneously with the sudden upward thrust, I heard the roar of her exhausts as they shot peculiar jets of pale blue flame rearward from below her tail laterals. Then she floated on an even keel and I arose, shaking.

Captain Markson stood in the center of the cabin, legs planted apart and arms akimbo, again in command. During the few long seconds when our lives hung in the balance I had not seen him once. His face was now livid and his mouth twisted in a rage!

"Madden!" he shrieked: "Stay at the wheel! Walton, Blunt, Wilson and Baker, come here!"

I mopped the perspiration from my brow with a shaking hand while Madden tensed at the controls; and the four pilots whom he had called detached themselves from the maze of instruments before them and dejectedly faced the captain. I glanced earthward; throngs of onlookers filled Main and Spring Streets, looking like white dotted insects as they stared upward at the huge ship. I heard Madden growling to himself and I looked at him. His face was calm enough and his senses entirely under control; but he was mumbling of dire things to perform on the persons of certain negligent pilots who had permitted the near-catastrophe to happen. Just what had caused it I was soon to learn, for Captain Markson bellowed with mounting rage.

"What in hell do you fellows mean by neglecting to test your elevators before your ship is put under way?" he roared. "Which one of you is to blame? What kind of pilots are you—correspondence-school gradu-

ates or just elementary students? Haven't you been drilled to test every one of your controls after landing? Why did you neglect to lift your elevators after we anchored? Are you all so damned ignorant?. Answer me you——"

Baker's Choice

AN utterly dejected young pilot stepped forward and saluted. Captain Markson frowned on him and raised an arm as though to strike him full in the face. But he controlled himself and raged, his ham-like fists twisting perilously close to the officer's frightened features.

"Speak, you idiot—you murderer!" Captain Markson bellowed wrathfully.

The officer's lips quivered for an instant before his words finally came forth.

"It was my fault, sir," he said tensely, his face sickly pale: "Mr. Madden ordered me to take charge of Control One for the take-off. It was my duty to test the laterals and set them for upward flight, sir. It was an accident that I overlooked it, sir!"

Captain Markson stared at the man curiously for an instant and then blew up again:

"So it was you, Baker?" he roared, stepping back to survey the negligent pilot of Control One. He turned, and tore from the wall of the control room one of its framed certificates, and thrust it at the pilot.

The man, Baker, took it from him meekly and hung his head.

"You're through, Baker!" he said. "Madden! Swing around and circle the station once at landing velocity! Baker, you will report to Mr. Worthington for your check! Prepare for a 'chute landing at once, sir! Walton, Blunt and Wilson, return to your posts!"

Pilot Baker stood for an instant, as though rooted to the floor, unable to move; then slowly he walked to the parachute rack, selected his own device and donned it rapidly. The other three pilots, glad to have escaped from the wrath of their commanding officer, returned to their various controls. Captain Markson strode to my side and peered intently through the observation exposures; then faced around.

"As a civilian witness, Mr. Rodman," he said, "you will bear me out in this decision at the Federal inquiry. You understand the situation as well as I do; I would make another landing if time permitted it, but I cannot afford to lose any more time. We must reach Tokio and Peiping without delay. I'm sorry, sir, that such damnable negligence has cursed my command."

I regarded him curiously. His features were stern and hard-set. The *Eastern Star* was skirting the towering City Hall obelisk. Her nose tipped slightly earthward, and I glanced around to observe Baker. He was standing in the center of the floor before a comparatively small round hatch, that yawned as the covering was thrown back; and he was prepared to step into the discharging cylinder. The ship seemed to hover over the anchoring towers for an instant. With a last look around the cabin, Baker faced Captain Markson and saluted.

"Good-bye, sir!" he said in half whisper that was barely audible: "It will never happen again sir!"

"I dislike to discharge you this way, Baker," Captain Markson said, his eyes softening for a second: "But it's for the good of the service and the protection of aircraft passengers! Good-bye, sir, and good luck!"

Baker eased himself into the tube which, I discovered, was for the purpose of saving the lives of the ship's forward crew in event of accident. That was true, but it was no life-saving device for Pilot Baker. I shuddered as he passed from view, haunted by the look in his eyes as he glanced, strangely, toward me. Captain Markson peered earthward for a sight of floating silk; what he saw caused him to start violently. Hurtling earthward was only a rapidly decreasing speck; Pilot Baker had elected to die rather than face the disgrace that he knew was in store for him!

A whining siren caused me to jump nervously, as I watched the falling speck, hoping to see the silken cloth bulge upward. I tore my eyes away. Captain Markson strode swiftly across the cabin and pressed a button below a three-foot square screen; it glowed with the wrathful features of Jackson Worthington. Jack's voice came through an amplifying reproducer to reach every nook and cranny of the control room.

"What the devil's going on in your ship, Captain Markson?" he demanded: "My God, you caused a panic that injured twenty people on the ground with your crazy antics! What's wrong, Markson?"

"Accidents have happened since man began to travel, sir," Captain Markson replied tensely: "Pilot Baker neglected to elevate and damn near smashed us up! I discharged him, sir, and sent him down in a parachute. I have already lost fifteen more minutes and I cannot afford to make another landing. I hope he arrived safe!"

"He didn't, Markson!" the official growled: "The field men are cleaning up the mess now! What about the inquiry?"

I stepped to the captain's side as he spoke again.

"Your friend, Mr. Rodman is a witness, sir!" he said evenly. "He will bear me up. Baker was given a perfect chance to land safely; but he chose the other way, I guess, rather than face the notoriety and disgrace!"

"That's right, Jack!" I put in, edging close to the screen so that my features would be transmitted to him: "It was Baker's negligence. He confessed to it."

"Anyhow," Worthington said, "that doesn't let us out of heavy damage suits. There must be a curse on the *Eastern Star!* She's had nothing but bad luck since we put her into service! Let me speak to Markson again."

CHAPTER III
An Inspection

I TURNED away to take up a post beside Madden. Intent upon watching the rapid progress of the *Eastern Star* over the city of Los Angeles toward the open expanse of the Pacific, I paid no further heed to the conversation between Markson and Worthington. We passed scores of red-lighted beacons that flashed brilliantly even in the late afternoon sun, guiding International Airway Express craft over their allotted lines. Gradually, the *Eastern Star* picked up speed as she sped on her belated course to circumnavigate the globe. Madden slowly increased her driving power until a faint hiss reached me in the control cabin. I felt a desire to inspect the propulsion principles of the huge craft; but elected to await the time when the excitement and ill-humor should have passed from the minds of the officers in charge. I wondered what had transpired among the other passengers during those few seconds of dire danger back at the station.

Captain Markson interrupted my thoughts by relieving Madden of the supervision of the controls. The first officer relinquished the post without a word; as though it were a usual thing for the captain to

assume that duty.

"I'll take her until we get beyond the coast, Madden!" Captain Markson said, staring at the instruments: "Seems as if I can't trust anybody on this ship of late. Anyhow, the barometer indicates low pressure over the Pacific. I'll navigate her through it!"

"Very well, sir!" Madden replied: "Shall I go through the ship to see how the passengers have come through it?"

"By all means, sir!" the captain grumbled: "Take Mr. Rodman with you and show him the ship. Mr. Rodman, this is First Officer Madden. I'll join you later when I feel safe enough in turning the ship over to these nincompoops!"

Madden smiled, and led me out of the cabin and down the corridor toward the reception room.

"Quite a close shave, Mr. Madden," I said, as we strode side by side down the hall: "Let me congratulate you upon your prompt action in saving the ship from crashing, sir!"

"All in the day's work," he replied quietly: "Such things are bound to happen at times. I happened to be the closest man to the reserve control; any one of the others might have done the same trick."

"But they didn't," I replied: "We would have been killed, without a doubt, if your mind had not been working rapidly."

"Thank you, sir," he said, looking straight ahead: "Nothing about that though to warrant a hero medal. And Baker was a damned good pilot-navigator! I can't see how he overlooked the elevators!"

"Seemed rather young to hold a pilot's rating?" I put in.

"Thirty-five is the best age for a pilot. Baker was thirty. Been with the company just a short time, however," Madden said.

"Married?" I asked.

"Don't know, sir," the officer replied, shaking his head: "From what I could see he wasn't much of a mixer; that is, he didn't confide much in his mess. The Old Man never did take much fancy to him; he didn't hop fast enough for Captain Markson. The captain is a flyer of the old school, who flew ships when aircraft still had struts to hold 'em together. Now that we have all-cantilever ships, he thinks the men need the struts to keep 'em up on their feet."

Panic had reigned, temporarily, among the passengers of the *Eastern Star* when her convolutions threw them about, in spite of the customary starting precautions. But, when Madden and myself had completed the tour of inspection, we were elated to discover that they had quieted down after the first scare, and most of them had retired to their cabins. Several had suffered slight bruises and abrasions from the tumblings they had received. But, on the whole, things were in much better condition than Madden had anticipated.

"Well, Mr. Rodman," Madden said presently: "There will be a few more minutes before your dinner time. If you are free, I'd like to show you the mechanical workings of the *Eastern Star*. I presume you are interested to know just how she is propelled?"

"I've wondered about its mechanical embodiments, Mr. Madden," I replied. "I've always felt an interest in mechanics, physics and aero-dynamics; although I understand but little of any of the sciences. If you don't mind showing me around——"

We went down a short companionway to the engine rooms where powerful units of machinery hummed, as the great craft swung swiftly through the heavens toward the northwest. I was awestruck by the compactness of the units. For such a large craft, I rather expected to find the *Eastern Star's* machinery spread all over an engine deck.

Just inside the door, behind a screen, and extending across the breadth of a room, were immense batteries of electrical units, that fairly sputtered under a bombardment of rapid-fire electrical charges which seemed to fly from one post to another, sizzling and crackling not unpleasantly. They seemed alive with power. Thick cables ran from each unit to a central manifold, that virtually glowed under cover of a green phosphorescence. From the manifold extended another series of cables, heavily covered with a lead-like metal. They disappeared behind an unattended panel. It was on the tip of my tongue to inquire about them; but Madden, sensing my curiosity, volunteered the information.

"These 'bats' distribute high-frequency current to ignite the driving explosives," he said simply: "The cables run from here to another chamber in which are housed the compression units. In internal-combustion engines, a high-voltage spark is used to explode the gases in the cylinders. The *Eastern Star's* propulsion principles are along the same lines; yet, instead of gasoline, paralene or other highly inflammable liquids, we use a combination of fuels in the form of a powder, which is driven into combustion chambers by centrifugal pressure. There the fuel is mixed with oxygen, exploded and driven through twelve separate units forming the driving-exhaust systems. You probably noticed the exhaust tubes extending outward from the rigid lateral platform at the tail?"

"No I haven't, Mr. Madden," I confessed. "Frankly I've never seen the *Eastern Star* or even her pictures before."

An Amazing Ship

HE stared at me blankly, as though questioning my ignorance of this tremendous air leviathan.

"What?" he said incredulously. "You've never seen this craft on her inspection tour around the country. I thought everybody had."

"I am ashamed that I must confess my ignorance again, Mr. Madden," I replied.

"Then I will enjoy the pleasure of making you acquainted with her, sir," he said: "It is rather odd that a man of your position has not had a chance to investigate such progress in aviation as this ship has developed."

"I've been too busy in the last few months attending to my own business affairs, to look into others, Mr. Madden," I said: "But I welcome this opportunity to learn something."

From the "battery" room, we entered another chamber; a half dozen perspiring men stood beside compact, oblong cylinder blocks, and watched the gauges that rested on panels above them. A low hum, like the almost inaudible purr of a new automotive engine, issued from each of the heavy steel units. There were in the room twelve such metal blocks, arranged horizontally across it. By each stood huge metal cylinders, each individually attached to its block by means of bright metallic tubing. Behind the blocks ran another series of tubes that vanished into another chamber toward the rear of the ship.

"Each one of these explosive blocks or units is capable of producing 10,000 horsepower," Madden remarked, continuing his interesting explanations: "These cylinders contain fuel for immediate discharge into the units. The powder is ignited within the blocks. With no other outlet than the tubes behind them, the

power thus created is forced through the interior exhausts. Carbon and other elements, left uncombined in the gases after they are first ignited, are in turn forced into a series of exploding chambers, similar to the first blocks, where they are discharged with terrific force. The power thus derived, wasting not a single atom of any portion of the original fuel, and using even the neutral gases, is exerted through the exterior driving exhausts, causing a backward pressure which forces the ship forward at a terrific velocity.

"Using a catalyte of *perellium*, our fuel is utilized by the addition of oxygen extracted from the atmosphere. The real novelty of this ship's propulsion principles, Mr. Rodman, is these explosive gases; the other features are secondary, because they follow the well-known principles of rocket propulsion. Other fuel-producing equipment is contained in a forward chamber where the air is treated with the small quantities of *perellium* necessary. The amazing feature of *perellium* is that, each time it is ignited, it forms a new explosive compound of lesser, but still great power. Thus, we can get almost an infinite number of explosions with almost unlimited power. As it is, the power we get from a unit quantity is many times greater than any explosive heretofore known. The great difficulty is, how to employ this great power to its full capacity. The *Eastern Star* does not utilize it all; our mechanical apparatus is not strong enough. The man who can create a new principle for the discharge of all the power contained in that fuel will earn for himself a greater fortune than the scientist who discovered the method of producing the gases."

"Interesting, Mr. Madden," I said: "Very interesting! But isn't there a possibility of this powder exploding itself in the tanks?"

Madden grinned good-naturedly.

"No more than gasoline in an automobile tank will ignite itself, Mr. Rodman," he said: "Like gasoline, our powdered fuel needs the high-voltage ignition spark to discharge it. There is no possibility of such a disaster."

"I trust not," I said.

"Let me show you our electromagnetizing units, sir," he said. "They are really interesting to observe; although most everything is housed up in tight compartments. Did you know that the *Eastern Star* has a surface covering entirely of cobalt-astralium-steel?"

"Cobalt-astralium-steel?" I asked: "What kind of metal is that?"

"I'm only an officer of aviation, sir, not a scientist," was his answer, "but I'll try to explain the metal for your benefit. As near as I can explain, cobalt-steel is an alloy of metals, light and strong, adaptable to a high degree of electromagnetism. Since it has been proved that Einstein's theory of relativity is correct, the new alloy has been developed with the addition of *astralium*, as the only known insulation against gravity. The metal, highly charged with electromagnetism, to a great extent nullifies gravity. By that means the *Eastern Star* is capable of rising under practically negligible power—only enough to overcome inertia. In landing, all that is necessary is to diminish gradually the charge of electromagnetism and she will drift down to the level of the anchoring towers. At the proper level she is again insulated, and on top of the landing pylons are hidden electromagnets which attracts the ship to anchor safely and securely."

I was awed at this tremendous advance of aviation. I had spent many hours in the air during my life, but never in a craft of the *Eastern Star's* magnitude. She was seemingly, the ultimate—all that man could ever hope for in flying. But I presume that, like those now obsolete, her type will eventually step aside—as did sail for steam and steam for electricity, like electricity for gravitational nullification and so on until man has worn himself back to the dust!

To A Rescue

I WAS about to press Madden for further details when a siren alarm sounded in the room. Instantly the crew attending to their work in that section of the ship stood tense, waiting for orders. Madden grasped me by the arm and hustled me out through the "battery" room and up again into the passenger quarters. Hurriedly we made our way through the throngs of loungers and strollers, and quickly entered the control cabin.

We rushed in to find Captain Markson bending over a glowing screen. His face was twisted in a scowl.

"What's up, sir?" Madden inquired at once. I stood near the observation exposures and peered ahead. The sky seemed overcast—it had grown thus in the time we had spent below. I looked downward; far below the billowing Pacific was hidden. The atmosphere seemed in a turmoil beneath us; banks of vapor twisted and writhed in dark, boiling masses. A terrific head wind bucked the streamlined ship and clashed with a roar against the exhaust pressure at her tail; every sound was audible within the enclosed control room. And the *Eastern Star* appeared to be standing perfectly still in mid-air; but I knew that she was penetrating the troubled skies at an unbelievable velocity. I shot a questioning look at the captain and his first officer as they stared into the luminous instrument. Then I heard Captain Markson's muffled oath.

"We are going to be held up again, Madden!" he said bitterly. "We'll have to go to the assistance of a tramp ship at intersection 28-12-6. The fool let his ship run into a high waterspout and seems to be ready to cash his chips. Well—we'll see what we can do about it! Take a turn around the ship, Madden, and see that every man is standing by. Mr. Rodman can remain here. I'll take the controls!"

As the first officer departed, I glanced at the instrument panels for a chance glimpse of our velocity and altitude. The altimeter indicator hovered at 49,000 feet; the velocimeter indicated 500 miles per hour. I stared at it open-mouthed, incredulous.

"We'll be alongside of her in ten minutes," Captain Markson said, taking the controls. "She's a hundred miles to the south of us. We'll lose another twenty-five minutes, perhaps a half hour, if she hasn't cracked."

"You mean you'll have to average six hundred miles per hour, Captain?" I asked, astonished.

He nodded as he touched a pedal on the floor with his boot toe. Frozen vapor was now beating with a loud clatter on the glass; the particles of ice snapped against the exposures with spiteful spats. The glass within was frosting around the edges, visibly creeping toward the panel-centers forming a circle. The captain turned suddenly toward the control operators.

"Blunt!" he snapped: "Lift her to sixty-five thousand until we get over this storm! Gradually now!"

Instantly the *Eastern Star's* nose pointed skyward at a gentle angle. After a short while, during which I felt a tremendous weight pressing on me, Captain Markson twisted a small wheel in the center of a large control, and she floated again on an even keel. I glanced at the altimeter; in the space of not much more than a minute we had jumped upward from 49,000 to 65,000

feet. The space below us seethed and writhed like a monstrous beast in agony. Captain Markson's voice brought my eyes to him; his face was stern and set.

"Wilson!" he shot abruptly: "Lift her another five thousand, and we'll be out of it!"

Already the frost began to creep away from its closing circle; the cabin was getting warm and stuffy. I breathed deeply and stared ahead; I was forced to shield my eyes, however, from the terrible glare of the sun which broke through upon us; its rays burned even through the protecting shield of thick glass. Captain Markson pulled his visor down over his eyes and touched the pedal again. I felt the ship leap forward like an arrow shot from a bow. The wind, even in this rarefied atmosphere, shrieked a high-toned, singing note in friction against the ship's snout.

The world seemed enveloped in a swirling mass, ever writhing and twisting. Far ahead I could see below a greater upheaval, that seemed like a great, cone-like spinning top! It seemed to race straight toward us and Captain Markson stubbornly nosed the *Eastern Star* down into it. The ship bounced and rolled under the force of the atmospheric disturbance from the spout, while it was still miles away.

Suddenly Captain Markson swung away from the controls and walked swiftly to the ship's television instruments.

"Hold her course, men!" he growled: "Head her right into the storm. We'll find the tramp somewhere in it!"

He pressed a series of buttons on a panel near the instruments and bellowed into a mouthpiece. No answer came. He swung the dials around and presently the shadows on the screen took shape. The haggard face of a man appeared in it, and I heard his nervous, tense voice coming through the speaker.

"For God's sake, can't I get some assistance?" he cried, eyes gleaming wide, nostrils dilated with emotion: "We can't last another fifteen minutes! Save us! Our position is Latitude 40-6 North, Longitude 132-12 West. Our ship is *No. 12* of the Iverson Freight Line. We can't hold together much longer in this weather. Our laterals and ailerons are ripping!"

Captain Markson waited long enough to get the name of the ship, then yelled loudly into his instruments.

"Ahoy, *No. 12!*" he shouted: "Do you get me?"

The man's features appeared on the screen again.

"I hear you!" he wheezed. Then his voice was broken with a fit of coughing: "Where are you? Hurry! The spout is lifting us beyond our capacity!"

"I'll be right under you in exactly four minutes, *No. 12!*" Captain Markson roared: "Get your engines running full speed ahead with the wind! I'll dive into the spout and break it! You'll be able to slide out of it! Then stand by to the windward, and we'll look you over!"

"Thank God!" the man groaned as his features sputtered out of the screen.

"Give her the gun, Walton!" the captain hissed between his teeth. "Cut the spout in two!"

CHAPTER IV
Into the Spout!

INSTANTLY the *Eastern Star* shot ahead at a downward angle and buried her nose in the upheaval! The storm outside roared ominously and then, as though the ship had dived into the ocean, the observation exposures were drenched with the deluge! Tons of water smashed against her nose with such force that the huge air leviathan groaned and shuddered, but she went on nevertheless. For several long, torturous seconds the deluge continued. The *Eastern Star* seemed, as it were, to be driving ahead in the depths of the ocean; then suddenly her nose swung out of the spout. A slightly westering sun, gorgeous in a radiant sky, appeared ahead, and the ship was free! There were a series of resounding clashes like the rumble of water on a rocky beach. I looked at the spout again, as the *Eastern Star* nosed into the sunlight; it seemed to have been cut in twain, and was falling rapidly in tremendous sheets of broken, tumbling water and mist. High above, where the spout had raged unchecked, floated *No. 12* like a huge sausage. She appeared to buckle in her center portions. Her stabilizing laterals had been torn away, and she pitched and rolled from side to side, drunkenly.

Almost immediately the *Eastern Star* swung around and headed for the helpless freighter. That *No. 12* was beginning to settle slowly into a gradual plunge, was easy to see. Despite the fact that her motors still roared in perfect rhythm, she made no headway. The screws appeared to have lost their power to pull, but they managed still to keep her aloft and from rolling over entirely and plunging plummet-like to the depths below!

As she neared the wreck, the *Eastern Star* slowed perceptibly. Captain Markson raced toward the exposures and regarded her with disgust.

"It's a damn shame that men have to navigate junkheaps like that!" he said, clicking his teeth: "There ought to be a law to prevent such obsolete craft from taking the air. They are a menace!"

Mindful of the danger of *No. 12's* possible plunge, Captain Markson refused to permit his command to get too close to her. I began to wonder how he was going to rescue the wrecked ship's crew. But I was soon to learn, for Captain Markson returned to his television instruments and turned on the power. The dials were already adjusted to the broadcasting wavelength of *No. 12,* and the screen glowed at once with the haggard features of her skipper. Captain Markson regarded him for an instant and then spoke roughly.

"Can you manage to get into port, *No. 12?*" he asked.

"I doubt it, sir!" the man wheezed, still coughing: "She's settling forward now, and she's likely to plunge at any moment! Can you take on my crew?"

"All right!" Captain Markson returned, scowling: "I'll do it! We'll spread nets on our hull top, and lay-to right under you in one minute! I'll take the chance with my own passengers for humanity's sake! 'Chute your men through the safety tube and I'll catch 'em in the nets. Hurry!"

The skipped yelled an unintelligible something, as the screen died. Captain Markson grabbed a telephone and yelled into it.

"Raise the rescue nets!" he bellowed: "And stand by for further orders!"

He hissed an order to the pilots; the *Eastern Star* edged into position under the rolling freighter and halted presently, laid-to. I glanced upward. Almost at once I saw a long string of rapidly falling dots. Then the nearest had his plunge checked, as a gossamer-white balloon of silk opened; then another bulged, and another. The crew was on its way downward. I wondered if they would land safely on the broad hull of the *Eastern Star.* There appeared to be no wind now, and they floated lightly straight down. I glanced warmly at Captain Markson. His face was

tense, and he plainly chafed at the delay in getting all the crew off as he watched every single movement of the apparently drunken craft above.

Presently a bell sounded: Captain Markson picked up a receiver and held it to his ear.

"Good!" he said. "Bring the men down at once. What? One man went over the side? Sorry! Is *No. 12's* skipper with them?"

I heard a faint voice coming through the tube. It was muffled.

"No!" the voice said: "He refuses to leave his ship. She's carrying a valuable cargo and he won't desert it!"

Captain Markson swore under his breath.

"Send the men down!" he shouted, "and stand by on the hull until I talk to the skipper!"

He swung to his instruments. The screen glowed, revealing the objects in the television room of the wreck. Markson pressed a button; I heard the signal as it vibrated furiously in the other ship. But no answer came back and Captain Markson picked up the telephone again and ordered the rescuers into the ship. The captain was spending precious moments trying to get a word to the skipper of the lost ship, while *No. 12* was pitching madly and threatened to drop down upon us at any moment. I myself was getting extremely nervous, as I watched each sickening plunge of the ship. Then, suddenly the reproducing units of the television instruments crackled. I glanced at the screen. The freighter's commander had reappeared.

"Thank you for saving my men, sir!" he was saying: "I can not leave—I'll face the music. Better get out from under at once! She won't stay up another minute!"

"Don't be a fool, captain!" Captain Markson growled. "To hell with that notion! Drop down now and we'll pick you up!"

"Sorry, sir!" the man said, a peculiar tone in his voice: "I go down with my ship!"

Captain Markson stamped a foot on the floor in a rage.

"I'm asking you to drop down now, skipper!" he roared: "I'll give you two seconds to decide. If you refuse, then be damned to you!"

"Pick up my cargo," the man argued, "and I'll go with you!"

"Go to hell!" Captain Markson swore: "I've got to make Tokio on time! I have the mails, and I'm ninety minutes late now! Are you coming down?"

Scarcely had Captain Markson finished his sentence than *No. 12* suddenly shuddered. Three of her whirling screws stopped dead. She tilted her nose upward for an instant and made a sickening half-roll over. But Captain Markson was not to be caught napping in such a dangerous position. He bellowed an order and the *Eastern Star* came to life; with a terrific recoil she shot ahead as *No. 12* plunged downward. I heard a series of rapid-fire explosions; the wrecked ship's hull seemed to open up suddenly and spew boxes, bales and mechanism. A fragment clattered against the steel hull of the *Eastern Star;* it sent a ringing echo reverberating through the ship. The *Eastern Star* roared ahead, rapidly gaining velocity. Captain Markson stood staring into the screen. I walked to his side. The screen revealed the tramp's skipper again; his face wore a mask of death, his lips drawn tight and bloodless across his teeth.

"Did you ask if I was coming down, sir?" he said with a trace of humor which manifested itself in the face of inevitable death. I admired him for it. Here indeed was a brave man—a man who could laugh and jest with the hand of death grasping at his throat. "Well, Captain," he continued: "I don't know how far I've come, but I went down a hell of a way!" Then he laughed loudly, almost hysterically, I thought.

"You had your chance, skipper!" Captain Markson said, coldly. I stared at him curiously. Though his words were cold and gruff, his face disclosed both admiration and sorrow for this man who was plunging to his death: "But after all, I guess you're right! There's no getting away from tradition! A man's got to go with his vessel, no matter whether it's an airship or a lumbering water packet! God be merciful to you!"

The perishing captain laughed maniacally, and waved a hand as the screen sputtered and died. I walked away with a deep feeling of regret, and glanced downward. Far below *No. 12* plunged like a plummet. Presently I beheld a small round patch of white; she had struck the billowing waves of the Pacific. A moment later I heard a muffled splash. That was all!

"Poor devil!" Captain Markson remarked, shaking his head. The *Eastern Star* roared westward toward Tokio, her first scheduled stop.

Far off our port scudded a huge airliner. I watched her with growing interest. The insignia, barely visible at the distance, told that she was of our own line, the International Airway Express; her driving exhausts, like our own, were spouting blue flame. The sun smote her abeam and she glistened like a thing of virgin gold. Then she dropped from view into the east.

Despite the late hour when we arrived, the air over Tokio was crammed with the quaint but speedy aircraft typical of the Orient. The *Eastern Star* came to a graceful landing at an anchoring tower, chaperoned by a half-hundred droning planes, their sirens shrieking a welcome.

Tokio was enjoying one of its annual air carnivals, staged until the late hours of the evening. Craft bedecked with genuine and painted flowers raced through the air with rollicking abandon; yet they remained at a safe distance away from the regular air lanes. I watched them, fascinated, as they cavorted hither and yon, lighted brilliantly from batteries of high-powered floodlights spread on the ground below. Ikamono Wrens, Hirashimoto Gulls, the more cumbersome Chochang metal blimps, and many other types of craft dotted the skies, piloted by care-free revelers. It was an open season for American tourists; and our passenger list boasted of many Middle-Western school teachers, bent on seeing pleasure-loving Japan.

I too felt an urge to desert the *Eastern Star* here at this delightful time, to enjoy the carefree carnival from a comfortable roof-top apartment in the American Quarter. For, after all, I had three weeks in which to enjoy my flight around the world.

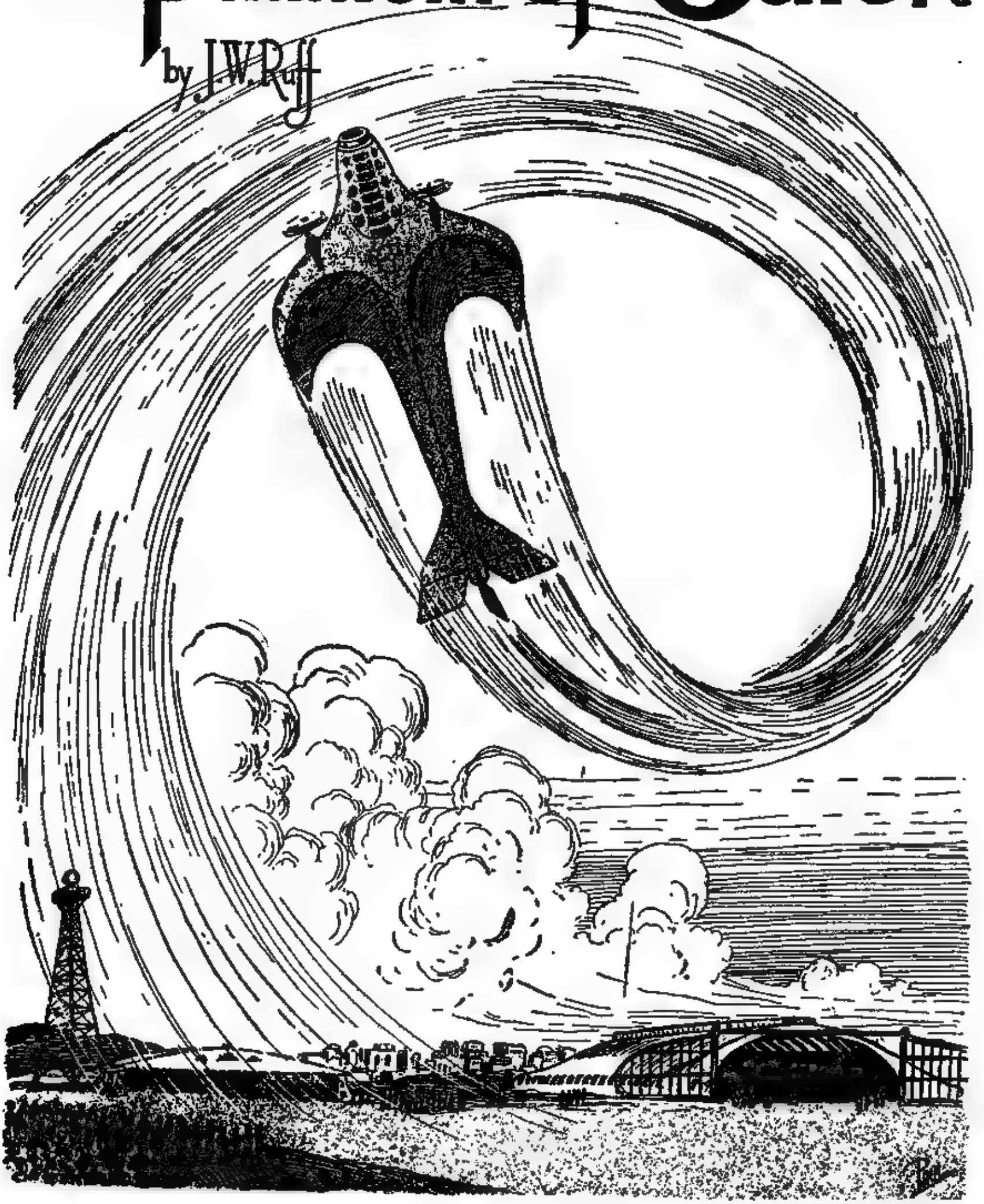
So it was with delight and anticipation that I ordered my luggage 'chuted to the landing. I had encountered plenty of excitement crossing the Pacific. Here was more—of a different sort, more inviting to the heart of a pleasure-seeking bachelor. I would remain in Tokio for three days; then board once again a great liner, and continue my flight around the world. I sought out Captain Markson and First Officer Madden and bade them good-bye. They seemed surprised at my decision to stop over in Tokio, and expressed their disappointment at not having me with them for the remainder of the flight; but I assured them that I would surely be with them on my next vacation tour.

But the remainder of this flight bore little excitement

(*Continued on page* 556)

The Phantom of Galon

by J. W. Ruff



(*Illustration by Paul*)

Like one gone mad, Manning put the *Skyrocket* through a more gruelling set of paces, than had ever before been employed in testing a flier of that size—quick turns, vertical climbs, nose dives, side slips.

THE PHANTOM OF GALON

ONE evening in June of the year 1938, a huge dark shape, from which gleamed numerous lights, could be seen speeding through the moonlit sky five thousand feet above the dark waves of the mid-Atlantic. It was the dirigible *Mercury* on her maiden voyage from New York to Paris which marked the establishment of the first successful trans-Atlantic passenger service by air. Since the *Graf Zeppelin* had flown successfully around the world in 1929 there had been several attempts at establishing trans-oceanic air lines; but none had hitherto been commercially self-sustaining.

Finally Robert Manning, a young scientist, had invented a new metal alloy called *Manoleum*, which was stronger than steel and much lighter than aluminum. When Manning discovered this wonderful metal, something which had been sought by scientists for years, a daring scheme for building all-metal trans-oceanic air-liners popped into his mind. After much planning and hard work, he presented his plans to a large American aircraft corporation. The officials were immediately enthusiastic and the result was that, after two years' intensive tests, the *Mercury* was leaving New York bound for Paris, with a scheduled running time of fifteen hours. The whole world paused to watch with abated breath the outcome of the new venture.

J. W. RUFF

At the moment when our story begins, the huge ship was eight hours out from New York and had encountered nothing, thus far, but ideal weather. Her powerful engines pushed her on through the night, at a speed heretofore absolutely unknown to crafts of the lighter-than-air type. But the *Mercury* was different from the usual lighter-than-air ship; in fact, she might have been considered a combination of dirigible and airplane. Her huge hull was much longer and more slender than that of the usual type of dirigible. A strange thing about this mammoth air-liner was that she was very heavy and, even when the hull was filled with helium gas, she weighed slightly more than the air it displaced. She was somewhat like a toy balloon filled with air which, when released from the hand, floats to the ground. Long thin projections, attached to the sides, served the same purpose as the wings of an airplane. Two motors installed on top of the structure, when set in operation, whirled huge propellers to move the craft forward and gave the wings sustaining power to send her soaring into the air. When the proper altitude was reached, the ten other motors, located in streamlined gondolas on the sides, took up the load and sent the huge liner racing forward. When a landing was desired, all motors, except two, were cut out and the ship proceeded to drift groundward; the descent being so slow that she came to rest softly as a feather falling on velvet. Although landing in a moderate wind was much more difficult, it was not dangerous.

Underneath the hull, running from stem to stem, was a cabin divided into several parts, namely: a control room, a dining room, a salon, a ballroom, a library and a glassed in after-deck. All the sleeping compartments were located high up, among the gas bags in the ship proper, and were lighted and ventilated by portholes. The whole structure, of course, was built of the metal *manoleum*.

This new type of aircraft was deemed a vast improvement over the dirigible; because it consumed less of the precious helium, while it traveled at a higher speed.

As the *Mercury*, bearing its human and other cargo, raced through the night toward Paris, there was much gayety on board. The strains of a popular dance tune floated from the ballroom, where many couples were gliding over the smooth floor. In the salon were to be seen groups of men and women laughing and chattering. In the library others were to be seen lolling in easy chairs and enjoying magazines and books. Some were relaxing, in the comfortable chairs and divans of the after-deck; and yet others had retired to their berths to be lulled to sleep by the steady drone of the high-powered motors. Over all was an air of luxury and security.

Yet, amid all this gayety, in a small but luxuriously furnished office, a young man, in his early thirties, was pacing back and forth like a caged tiger; he was none other than Robert Manning, the designer of the *Mercury*. Why, one might ask, should he be so worried? The ship was already half way across the Atlantic and had thus far surpassed the highest expectations. It was better that a young man whose name, on the morrow, would be on everyone's lips, should be enjoying himself with the merry-makers.

From time to time Manning would pause in front of a closed door, listen for a moment, then continue his pacing. At last, the door opened and out stepped a white-clothed medical man.

"Is everything all right, Doctor?" he asked anxiously.

"Congratulations, Mr. Manning!" replied the doctor in a deep, pleasing voice: "It's as fine a boy as I've ever laid eyes on."

"Thank God!" cried the young man, and then proceeded to dance a hornpipe.

"Hey! what's the idea

SCIENTISTS are agreed upon the fact that (providing the money were forthcoming) it is possible today for an engineer of more than usual abilities to build aircraft that could raise havoc with our commerce in more than one way.

Never in the history of the world has it been more possible for a single man to work havoc and create destruction than today; and this is due principally to the advances in aviation.

The present story brings this fact home with a vengeance; and it is interesting chiefly because it shows us how little present-day authorities are prepared to meet the menace from the skies, that we may be sure will come about sooner or later.

If our city, state and national authorities can be brought to realize that some time or other some maniac bent on destruction is likely to run amuck, stories such as this have accomplished their purpose; because then we will be well-prepared for the emergency.

of the rough house?" broke in a cheery voice, as another young man, of about Manning's age, entered a door on the opposite side of the room.

"Congratulate me, Dick, old top," said Manning joyously: "I'm the proud father of a bouncing baby boy, and we're going to name him after you. How does Richard Herrick Manning sound, eh?"

"Great! Bob, great," Herrick replied, "and we will yet make him as famous as his father."

Thus it was that Richard Herrick Manning came into the world traveling at the rate of two hundred miles per hour, five thousand feet above the Atlantic. He had the honor of being the first babe to be born crossing the ocean by air. At the time a certain newspaper called him a son of science; but little did anyone realize what a master in the realm of science he was to become.

Coming of the "Phantom"

TWENTY-FIVE years had passed since that night; the first flight of the *Mercury* had become just a memory, a step in the progress of man's successful efforts to conquer time and distance. Larger, finer, and more highly-perfected ships had long ago shouldered out the *Mercury*, which, with the lapse of years, had already passed to the junk-heap.

During the quarter century since that exciting night, Richard Herrick Manning had become a very fine specimen of young manhood. At the age of twelve he had begun to take a great interest in science. This, of course, was very pleasing to both his father and his father's intimate friend, Richard Herrick, after whom the lad had been named. But, when young Manning was but fifteen, his father and mother met death together in an air disaster. It, therefore, fell to Richard Herrick to be both father and mother to the youthful orphan.

"Uncle Dick," as Herrick was called by young Manning, proved to be a very efficient guardian, and under such tutelage, by the time the youth had reached twenty, he was not only an athlete of distinction but, without doubt, one of the most promising young scientists in the United States. During the mornings Herrick and his protégé were to be seen working industriously in the laboratory or workshop; but after lunch all scientific apparatus would be laid away, and the afternoons spent in hunting, fishing, flying, or strenuous sports.

After Manning had reached man's estate, and acquired a coveted position as technical advisor for a certain large aircraft corporation, a change came gradually over the once jolly Herrick. He became moody and irritable. More of his time was spent in the laboratory and, what was worst of all, he and young Manning began to disagree on certain matters of science. Gradually the gap widened between the two, who had been almost like father and son. At last Herrick, to avert an open break, moved to the West coast; some time later Manning received from him a letter saying that he was engaged in work that would carry him all over the Orient. From then on they corresponded in a desultory way, and young Manning received occasional letters from China, India, Java, and many other places.

Dick Manning was just twenty-three when the *Phantom* appeared. The newspapers announced with blazing headlines that the great air-liner *Mammoth* had been captured and plundered by an unknown craft. A long dispatch followed, which told in detail how the huge airship had been held up by a strange black ship and robbed of well over a million dollars in gold. Although crime in the air was not absolutely unknown, never before had a fast ship like the *Mammoth* been attacked. Because the pirate became invisible at a short distance, it was given the name, the *Phantom*.

No one on board the *Mammoth* seemed to know much about the robbery, it had happened so quickly. Men in black cloaks, with black hoods over their heads and faces, had found their way down from the top of the ship, held up the purser, forced the strong room, carried out the treasure, and bore it aloft. Just as the alarm was given the pilot saw a dim shape race away and vanish into the night.

The papers accepted the incident as the usual part of the day's news until, only a few days later, another air-liner was attacked; and this time the victims were sent plunging into the sea. Then followed a reign of terror; surface ships were blown up; cities were bombed, and airships were sent to destruction; always at night, by a black airship which afterward faded away almost instantly into the night.

The world was aroused; the United States dispatched ten of the fastest military planes in existence with orders to bring down the pirate ship. At last the pursuers succeeded in getting on the trail and chasing the *Phantom* for many miles; but its speed was so great that each time it eluded them. The ship would remain just out of gunshot and, when the high-powered motors of pursuers began to labor under the strain of such speed, the *Phantom* steadily drew away and left them "holding the bag."

Some days later the government planes, flying over the Arizona desert, came upon the *Phantom* lying, like a huge dragon of old, upon the sand. One of the men later described it as being "just a long black shell, with a point in front like a dagger, and fins at the back." The aviators dropped bombs; which strangely failed to burst. Then, the planes' motors became suddenly paralyzed; and those mighty machines seemed to be clawed from the sky, as easily as a kitten claws a ball of yarn from a chair. Only two men escaped death, and they seemed almost insane as they told their story.

"It isn't natural!" one screamed, like a man demented: "I tell you the devil himself is behind it all! I can see the thing, still, lying there on the burning sand, dead and lifeless, like a huge black torpedo. Then I felt a slight shock pass through my body and, the next thing I knew, our motors were dead and we were heading for the ground."

A slight break occurred in the man's story at this point, and he shivered as with the ague:

"As I crawled out from the wreckage of our plane, there the thing was, hanging suspended about fifty feet in the air and making a whistling sound. While I watched, it shot away like a bullet, with a low hissing noise, and disappeared behind the range."

CHAPTER II
Herrick's Return

WHILE the reign of terror lasted, only one man had the opportunity to view the *Phantom* at close quarters and lived to tell the tale. A certain young inventor was trying out an electric airplane one evening about dusk. His plane was working; but not to his satisfaction. He was contemplating the necessity of landing, before his batteries went dead; when out of the West came a black shape! Suddenly, a bright light shone on him; the thing hovered over his head, and he saw for a moment a long cigar-shaped craft, sharply

pointed at the bow and having huge fins atttached to its stern. At first glance, the thing seemed to be made of steel plates riveted together and painted black. At various points along the sides were crystal-covered ports, through one of which shone the brilliant light.

For a moment the apparition, hissing like a python, hovered above the terror-stricken young man; then he felt a slight shock pass through him, and the thing was gone into the night.

One thing only the world had learned by this incident; that the terrible power which the *Phantom* exercised to paralyze combustion engines had no effect upon electric motors. Undoubtedly, the shock experienced by the inventor was the same as that which had been described by the army aviators.

There was much conjecturing as to where this strange craft came from. Some said from the Arizona desert, some suggested from far-away Mongolia; and a syndicate writer with a fertile imagination even went so far as to hint that the *Phantom* hailed from the moon or Mars. One paper intimated the possibility that anyone's best friend might be the contriver of the *Phantom* and, as a result, old friends became suspicious of each other.

For six long months the reign of terror continued. The governments of the world became desperate; and a king's ransom was offered to the man who should give information leading to discovery of the *Phantom's* headquarters. Scientists worked day and night trying to find some means to cope with the menace. "The brain that directs this diabolical machine," said one prominent physicist, "has ideas a hundred years ahead of the times." It was all too true; a master mind was being matched against the aviators of the time.

At last, after six months of repeated outrages, the reign of terror ended; and the *Phantom* was not heard of for more than a year. The world breathed a sigh and went more cheerfully about its affairs.

While the *Phantom* was following its career of wanton depredation, Richard Manning had been very busy working out an idea which his father, at the time of his death, had in the process of development. Although the papers each day announced some new atrocity committed by that terrible ship, Manning gave the *Phantom* little thought and spent most of his time in the laboratory. Certain of his friends were wont to criticize his attitude toward the *Phantom*, and ask him why he did not aid with his science to find a means of combating the terrible curse which had settled upon the world. He took these rallies good naturedly, and usually would say laughingly that, when he had perfected his new machine, the days of the "Phantom" would be numbered. But, before the new Manning invention could be perfected, the *Phantom* had disappeared.

During the year of quiet which followed the reign of terror, Dick Manning worked hard and succeeded in completing his invention. It was with a feeling of contentment that he awaited the arrival of Richard Herrick, whom he had not seen for over two years, but who was now stopping off on his way to Europe to pay his protégé a visit.

It was on the first evening, after dinner, that Herrick, who seemed to be again in high spirits, said to Manning:

"Richard, my boy, what is this new electrostatic motor of yours that you mentioned in your letters? Is it really practical?"

"You bet it is!" replied the youth with enthusiasm: "Why, when I finish it, the *Phantom*—if he still exists—may as well give up the ghost."

"Well," chuckled Herrick after a time: "it must be a whole lot better than some so-called electrostatic motors which I have seen."

"Now, Uncle Dick," went on young Manning seriously: "I know that the idea of utilizing static electricity as a means of motive power was long ago abandoned by most scientists; but there was one who did not lightly cast the idea aside, and that was my father. I found among his personal papers, soon after you went West, a set of drawings which outlined a scheme for making the utilization of static electricity really practicable. With these plans as a guide, I have at last succeeded in producing what I call a static supercharger, as well as an electrostatic motor which runs with great efficiency on the power furnished by the supercharger."

Young Manning then proceeded to outline to Herrick just how the supercharger and motor worked. There is no reason for boring the reader with a detailed scientific discussion of the machine, but perhaps a few words should be said about its nature.

The atmosphere at all times contains a certain amount of static electricity; sometimes its concentration reaches a high value, and at other times there is very little. Lightning, for instance, is a discharge of static electricity, either between two clouds or between a cloud and the earth. To understand why static electricity has never been brought into use, the reader must bear in mind that (in terms of electricity) "volts" means electrical pressures and "amperes" means current-flow. In high-school laboratories there are electrostatic machines which discharge sparks of four and five thousand volts. These discharges, have, however, practically negligible amperage and have little energy value. They may be taken through the body without endangering life.

Richard Manning with his new static machine threw a new light on the subject. Briefly, his invention consisted of an instrument that drew static in enormous quantities from the atmosphere. By means of coils, chemical rectifiers and other strange devices, the charges of high-voltage static were converted into current of considerable amperage which operated a specially designed motor of super-efficiency.

The Girl

EVEN Herrick, hardened old scientist that he was, showed astonishment when he saw evidence of the terrific power from the atmosphere made available by the strange machine; during the rest of his stay he seemed at times, to be deep in profound meditation. All of this Manning noticed perfunctorily; but, at the time, he gave it little thought.

At last the day came for Herrick to continue his journey to Europe. In contrast with his previous mood, he was in excellent humor that morning at breakfast.

"Say, Richard," he said, stirring his coffee, "Why don't you let your work ride for a while, and go with me to Europe? The change will do you good, and we will be back in a couple of weeks."

For a moment Manning pondered, then he said: "By George! Uncle Dick, that's an idea. I believe I will." And so, when the air-liner *Ambassador* rose from her gigantic landing stage in New York, Herrick and Manning were among those on board.

Nine hours exactly was the time required by the new liners to fly from New York to Paris. They left New York usually at six o'clock in the evening, New York time; and arrived in Paris at eight the next morning, Paris time. The *Ambassador* was one of the largest on the line and, during its two years of service, not once

had it failed to arrive at its destination on time. Not even the worst of storms had marred its splendid record.

During the early evening Richard enjoyed the flight immensely. For some minutes he amused himself by looking down through the windows of an observation deck upon the waves of the great Atlantic. From time to time surface ships—mere toys they looked from that height—slid past and soon disappeared into the west. At last, when he had tired of looking at the sea, he went into the news room, read the latest bulletins, and then retired to his stateroom to dress. He had seen but little of Herrick, who was now very busy, sending radiograms attending to matters which he had neglected during his short stay at Manning's home.

When twelve o'clock came, however (they had set their watches at once five hours ahead to Paris time) Uncle Dick joined Manning, and they went into the brightly-lighted dining-room. It was well filled with diners in evening attire and, above the buzz of conversation, could be heard the strains of an orchestra. Attentive waiters, garbed in spotless white, glided with heavily-laden trays to and from the kitchen.

Mr. Richard Herrick Manning was just in the act of cutting a particularly juicy piece of filet mignon, smothered in onions, when a delicate aroma of violets assailed his nostrils and the steward swept by with a stylishly dressed young lady, of possibly twenty-two years, in tow. He found the girl a seat at a nearby table, facing Manning. That gentleman, forgetting himself for an instant, ceased cutting the steak to stare after her. As she seated herself, she gave him a cold glance, and, very much embarrassed, he fell to eating industriously. When he again plucked up courage enough to glance furtively in her direction, the smile on her face reassured him that she was not altogether displeased by his admiration. He colored, but managed to smile back. As he later said to Herrick: "She is, without doubt, the most beautiful girl I have ever seen, Uncle Dick. Her eyes, her hair, her lips, are perfect."

"Rot, Richard! perfect rot!" Herrick had scoffed: "who ever heard of a cold-blooded scientist falling in love at first sight? Why, boy, the idea is preposterous!"

Richard, however, was not so sure. After dinner, while he was reading in the library, a breath of that soft perfume came to him again; and he looked up, just in time to see Her disappear through a door into the salon. But, glory! There on the floor in front of him lay a bit of lace and chiffon. Like a shot, he was out of his chair and after the fair one who had let it fall. Amid the groups in the salon, he picked his way and at last caught up with his goddess, just as she was entering the ballroom.

"Pardon me," he said, holding up the little handkerchief, "but did you not drop this?"

"Oh how careless of me!" she exclaimed, in what Richard thought an extraordinarily pleasing voice: "Thank you, ever so much." There was an awkward pause; and then the orchestra struck up a lively tune. He spurred his courage—"May I have this dance?" he asked boldly.

"Why!"—she hesitated, and capitulated—"I guess so."

The next moment she was in his arms and they were whirling over the polished floor. Richard Herrick, who stood idly watching the dancers, had seen them. "Humph!" he snorted, and strolled back into the salon.

But Richard Manning did not see him.

At that moment he was incapable of seeing anything.

CHAPTER III

The "Phantom" Returns

FOR one who was unfamiliar with the wiles of women, Richard progressed famously. He learned that the youthful beauty's name was Margaret Huntington, and that her journey to Paris was in order to join her father, Professor R. L. Huntington, whom Richard knew well as one of the world's greatest physicists.

Upon learning her father's name, he immediately expressed his interest, an actual one, in the theory which Professor Huntington had most recently advanced; but, in reality, his principal interest at that moment was centered on the daughter. No one, however, could blame him; for, with her auburn hair, her cool eyes, and her clear creamy skin faintly tinged with pink, she was indeed beautiful. Perhaps, though, the interest was not all one-sided; for the clear-eyed, tanned young athlete had, unknown to himself, often made many a young lady's heart flutter.

Although Richard never dreamed of it at the moment, it was not altogether strange that the innocent little bit of lace and chiffon should have managed to drop directly in front of his chair.

For more than an hour the young couple alternately danced and chatted upon the cosy after-deck into which the ballroom opened, where couples sat out the intermissions. It seemed, already, that they had been lifelong friends. But the rapid course of the giant air-liner to the east was causing time to redouble its pace. The hour was still late at New York; but it was far into the early morning at Paris. Up there, far to the north in the Atlantic, day was rushing to meet them; in less than an hour it would dawn. The orchestra ceased; the lights in the ballroom were turned down.

"Oh!" exclaimed the girl rising hurriedly, "who would have thought it is so late?"

It seemed as though Richard held her hand a trifle longer than was necessary, as he bade her good-night; but, if he did, she seemed not to mind.

For a time after the lights had been dimmed, Richard stood at the observation window, looking downwards and back, and listened to the steady drone of the motors. Once, a brightly-lighted steamer passed below and flashed a huge searchlight upward; but it soon faded from sight and only a faint glow from its rear lights was left to soften the pitchy blackness of the sea.

At last the captain of the huge air-liner—a jolly, likeable sort of a chap—came out on the rear deck. He greeted Richard, whom he knew well, and the two chatted about various things.

"Say!" remarked the captain, suddenly pointing astern, "what does that look like to you?"

Richard looked and managed to make out a tiny pin-prick of light which seemed to be moving rapidly in their direction.

"It looks like a shooting-star to me," he replied, "but it must be some other ship."

"Hm-m," mused the captain: "Yes, it looks like a shooting-star; but it moves a little too slow and lasts too long. On the other hand, it moves too fast for an ordinary ship. There's not a ship built that can overhaul the *Ambassador* when she is moving so near her maximum speed, as we are now. It might be a scouting plane, but it doesn't appear like one. Yes, that light is steadily growing brighter." It was true. As they watched, the light had steadily become larger and more brilliant.

"It's no ordinary ship," said the captain. A touch of grimness edged his tone: "It must be that damned 'Flyin' Dutchman' of the air, the *Phantom*."

"The *Phantom!*" echoed Richard in a whisper, and he felt the hair raise on the nape of his neck.

"I must get up forward and take charge of things!" exclaimed the captain, showing some agitation, as he rushed along the darkened corridors toward the control cabin. Like one in a daze, Richard stumbled after him, and at length came into a small, dimly-lighted room where the captain was already giving orders to several of his officers.

"Halta!" rang a cold voice, with a slight foreign accent, from the radiophone.

"Full speed ahead!" bellowed the captain. The huge motors took on a new tone as the speed was increased. Suddenly, without warning, the fifteen mighty motors, which propelled the ship, ceased to roar; they seemed to stutter a moment, and then stopped with a wheezing cough. A silence that could almost have been cut with a knife settled over the huge monster of the air. For the fraction of a second, every man in the control room stood aghast. The young wheelsman was the first to break the silence.

"My God!" he cried in panic; "We've gone dead!"

"Keep cool everyone!" yelled the captain, "and start the auxiliaries!" An instant later the four electric motors on top of the ship whirred, and their descent was slowly checked.

"Every man to his post!" ordered the captain, "and be prepared for anything."

"Can I be of any assistance?" asked Manning, stepping forward.

The captain then pulled from his pocket a beautiful automatic electric pistol and pressed it into Manning's hand. "Climb up here to the top of the ship and plug the first pirate that tries to get down here," he said, and turned to continue giving his orders.

A narrow spiral staircase extended from the control room, through a tube, to the upper surface of the ship. Up this steep helical stairway, the gun gleaming in his hand, climbed Richard Manning, passing at regular intervals the small doors which gave access to the different corridors in the ship. As he reached one of these, he heard a stifled scream in the corridor on the other side. Waiting to hear no more, he yanked open the tiny door and found himself looking down a long hall, which he might have recognized as the one on which his own stateroom was located.

He gave that fact no thought; for there, not five yards away, was Margaret Huntington, the girl of the lace handkerchief, struggling in the grasp of a black-cloaked and hooded figure! As the door came open, the sinister invader straightened and looked up. For a moment Manning saw two slits cut in the hood and through them felt that two coals of fire were shining upon him. Then the masked man turned and fled down the hall.

"Stop!" yelled Manning and, raising the automatic, fired. The figure dodged into a stateroom as the electric bullet exploded into flame against the *mahogany* door frame. The flash died out instantly, and the door slammed heavily.

"Are you all right, Margaret?" Manning anxiously asked, as he gently raised the girl from the floor.

"Yes, I guess so," she replied weakly, "but oh, Dick, I'm afraid!"—and she relaxed into his arms. As Dick Manning felt that beautiful creature huddle closer against him, a strange exuberance swelled in his heart and he crushed her to him and smothered her with kisses.

"I love you, Margaret," he whispered, "I'm crazy about you."

"I love you too, Dick," she replied, gently pushing him away and rearranging her hair.

"What's all the rumpus?" demanded a bald-headed old gentleman appearing in pajamas: "I heard a shot and I open my door to find some fresh whippersnapper of a boy making love. I tell you I'll report this to the—"

"Save your breath!" broke in Manning: "that shot you heard was fired at the 'Phantom' and he escaped through that door."

Exciting Events

BY this time the whole ship was astir; it was, therefore, quite a crowd that followed Manning into the stateroom through whose door the hooded figure had disappeared. It was with some surprise that Manning now noted that the room was his own! There, on the side opposite the door, a yawning porthole told very plainly how the "Phantom" had escaped. A small ladder ran past the porthole from a gondola, several yards below, up to the topmost platform of the ship.

Next to Manning's stateroom was that of Herrick; the two rooms were linked up by a small bathroom. Manning stepped to Herrick's door and jerked it open. Herrick, rubbing the sleep from his eyes, sat up in bed.

"What in the devil is the idea of waking a man at this time of night?" he grumbled.

"It's the *Phantom!*" exclaimed Manning.

"The *what!*" questioned Herrick, suddenly aroused to interest.

The conversation was interrupted by a loud crackling noise which seemed to come from above.

"Good heavens! what's that?" exclaimed Herrick, looking toward the porthole. Manning dashed to it and looked out, but he saw nothing. Instantly he decided to crawl through that of his own room and climb up the ladder to the top of the ship. In spite of the fact that the ports on the *Ambassador* were somewhat larger than those on surface ships, it was with considerable difficulty that Richard managed to squeeze through. "Gee!" he thought to himself, "that 'Phantom' fellow must be a sure-enough phantom, to crawl through a hole like this." At last, however, he succeeded, and clung to the tiny ladder with the cool night breeze fanning his brow. High above him on the roof of the liner he could still hear that intermittent crackling. Far below him, somewhere in that black void, lay the grim Atlantic, waiting to swallow him up should he make a misstep. A shudder passed through him as he thought of the sea over a mile below him; but he steeled his courage and started climbing.

For what seemed an age, he climbed, and gradually, as the top was neared, his path curved to the horizontal. At last, he came to a position which enabled him to view the extreme top. Some distance down the length of the ship, to his left, was a beam of light streaming out through a manhole. Slightly to the right of the manhole he could make out a dim black form, around which snapped and popped electrical discharges; and which, he judged, was not over a twentieth the size of the *Ambassador*. The intermittent electrical discharges shed a ghastly light over the larger ship, and in the glow he could see two of the whirring propellers that kept the great air-liner moving aloft. Not a single light shone from the *Phantom*, as he judged it to be, except for the electrical fireworks.

Suddenly as it had begun, the electrical display ceased and left only the whine of the auxiliary motors to break the silence. Then Manning saw a light appear near the base of the shadowy ship and, in its glow, he was able to make out several persons. A tiny spark bobbed along toward the lighted manhole in the top of the *Ambassador*. Then, to Richard's surprise, there was a metallic sound, followed by a blood-curdling scream; the sparks flew off into space and the screaming grew fainter and fainter as the victim followed the tiny light down, down into the unfathomable depths.

For an instant Manning, frozen with horror, clung to the ladder and wondered how it felt to be struck by a propeller rotating at high speed, and hurled off into an abyss. He was brought to his senses by the rattle of a machine gun, which was cutting a red streak through the darkness at the edge of the manhole toward the light that shone from the *Phantom;* the officers of the liner were firing on the pirates. Manning raised his gun, aimed also toward the light, and pressed the trigger; its electrical missiles flashed among the shadowy figures. The new element entering into the conflict evidently frightened the *Phantom's* crew; for the light went out, a loud hissing arose, and Manning saw the huge dark shape shoot away into the night.

For the rest of the night, to most of the passengers of the liner, sleep was out of the question. There was one man, however, who returned to his berth as though nothing had happened, and that was Herrick.

"Uncle Dick has nerves of steel," his nephew remarked: "I really believe if the ship were on fire he would grumble about being disturbed."

Every one on board was anxious to hear Miss Huntington's story of the attack, and how it had happened. The following is the story in her own words, as they appeared in the newspapers the next day.

"I retired rather late and tossed for some time in my berth. Then I heard a loud hissing noise, that seemed to come from outside the ship. I sat up in bed and was terrified to see a terrible, ugly face peering at me through the porthole. I screamed, jumped out of bed, and rushed into the hall, only to be caught by that awful figure in black. If Mr. Manning hadn't arrived on the scene, I dread to think of what would have become of me."

Of course the whole world was stirred up over the reappearance of the *Phantom,* and the world's governments renewed their efforts to run down that terror of the air; but, as before, all their activities ended in failure.

CHAPTER IV
The Abduction

DURING the two weeks Manning spent in Europe; he saw a great deal of Margaret Huntington, the girl of the auburn hair. He also met and took a great liking to the blunt, grizzled old man who was her father. The magnetic personality of the young scientist and inventor had its effect in turn upon the flinty nature of the physicist.

"Young Manning is a person," he told a friend, "who will get ahead in this world. He has some unique ideas and has enough force in his make-up to push his schemes to the finish. I should be glad to give the dearest thing I possess to such a fine young man." Such a long discourse from Dr. Huntington was extraordinary, to say the least; but it showed the high esteem in which he held Richard Manning.

When Herrick had completed his business in Europe, he and Manning returned to America; and with them returned Margaret Huntington and her father. Herrick was disgusted at Manning's affair with Miss Huntington, and did not endeavor in any way to disguise his feelings.

"Love wasn't made for scientists," he grumbled. "Who ever heard of a scientist that amounted to a damn after he got married?"

"How about R. L. Huntington?" Manning gleefully threw at him.

Herrick growled something about "feather-brained youth," and allowed the subject to drop for the time.

So Richard pursued his wooing unhampered. He proposed, and was accepted.

At last, the evening of the wedding arrived. Herrick had never been fully reconciled to his former ward's infatuation; but the night of the wedding found him on hand.

The guests had all arrived and everything was in order. Young Manning, who should have been the happiest man in America, was plainly nervous; while Herrick was in strangely good humor. He laughed and joked with almost everyone present, seeming the gayest of the guests. This mood struck Manning as being rather mercurial; because, just an hour before, at dinner, Herrick had told him very plainly that he did not yet approve of the match—why, he did not say.

"I can't figure out Uncle Dick these days," Manning remarked to Dr. Huntington: "sometimes he acts like himself and then, at other times, he seems to be some other person."

"Don't try to understand, my boy," said Huntington, dryly: "all of us old codgers get that way as we work up toward our second childhood."

Richard laughed and dismissed the matter from his mind.

The time for the ceremony arrived, but the bride did not descend. Fifteen minutes dragged by, and still no Margaret. Finally, Dr. Huntington started upstairs to see what was detaining her.

"She's probably still primping, or weeping, or doing some other fool thing," he growled as he strode off.

In a moment he reappeared at the top of the stairs. His face was ashy—

"She's gone!" he cried frantically, and waved a yellow scrap of paper in his hand.

Like a flash Manning was up the stairs. The condition of Margaret's boudoir told plainer than words what had happened. There had been a struggle; she and her servant had evidently been carried bodily from the room into a balcony that overlooked the garden. The French doors leading to the balcony were open and a small silk handkerchief lying on the threshold proclaimed what had happened. A flier, of some type, had probably furnished the means of escape for the kidnappers.

A chill passed through Manning's heart, when he saw the condition of the room. This turned to dismay and utter dejection, as he read what was written on the piece of paper that Huntington handed him. It was a small yellow sheet torn from a pocket notebook; and on it were but three lines of typewritten words in red:

> "Margaret Huntington is dead to the world! The man who pursues dies, and he places all mankind in jeopardy!
>
> The 'Phantom.'"

Manning, after reading this terrible proclamation,

over and over, sank into a chair and buried his face in his hands.

"Good God!" exclaimed Herrick, who had followed, and had taken the message from his trembling hands: "The fiend threatens the whole world! What are you going to do, Richard?"

Manning slowly raised his head. His face was haggard; he had aged ten years in the last five minutes.

"I don't know," he replied listlessly, "I guess my hands are tied."

Dr. Huntington, man of iron that he was, sat down heavily, and shook with sobs.

Two more weeks dragged by; Dr. Huntington had returned to Paris and Herrick to the West coast. Manning was almost on the verge of insanity. At night in his dreams he would see Margaret struggling in a slimy crocodile-infested river; while he stood chained to the bank utterly unable to help her in any way. Then, he would see her dragged under by some loathsome monster, and he would wake with her despairing cries ringing in his ears. From this terrible nightmare, he would fall into another, in which he would see cities being consumed by fire and thousands of people being killed by a terrible monster that breathed forth smoke and flame.

The *"Skyrocket"*

THE reader may think it strange that strong men like Manning and Huntington should give up without a struggle; but the *Phantom* had so terrorized the world that its invulnerability was conceded. A stupendous reward had been offered for the capture of the *Phantom's* master; thousands had pursued him hopelessly, and now he threatened to turn and swallow the world, unless left to his dark devices. Of course, Manning doubted that the *Phantom* could really exterminate the human race; but he knew that the monster could play havoc with civilization. This was why he hesitated to seek vengeance.

At last, though, he could endure his inaction no longer; he made up his mind that the *Phantom* must be removed once and forever from the face of the earth. But how was he to accomplish this? How was he to make a machine capable of attaining a speed equal to that of the pirate ship? And then, to find the lurking place of the *Phantom?*

He sent for Herrick; but received word that the latter had ventured into a remote part of Asia to seek some kind of mineral deposits. He next turned for aid to Margaret's father, Dr. Huntington, and was shocked to learn that the old physicist had suffered a complete lapse of memory, and was undergoing treatment in a Paris sanitorium. If Manning had read the newspapers in the meantime, he would have known that under the shock of losing his daughter, Huntington's great mind had been jerked from its moorings and thrown into a state bordering on chaos.

So of the three great scientists, Richard Manning was the one upon whose shoulders rested the whole duty of running the *Phantom* to earth. But the great question that confronted him was, how to go about building the proper ship? He knew that with his electrostatic motor terrific power was available; but to attain a speed of five or six hundred miles an hour, even with unlimited power, was no small task. Of course, his estimate of five hundred miles was just a guess at the speed of the *Phantom;* it might be that and it might be five thousand. At the time, he decided to make his goal six hundred miles an hour, almost twice the speed of the average flier. But, after a great deal of figuring, the main question still loomed: how could he do it?

For hours he pondered that question; then, as he went out to exercise in the park, the solution was revealed to him by a small boy. The little fellow had in his hand a large rubber balloon which he would inflate to capacity, then deflate by releasing his finger from the end and allowing the air to rush out. At one time, when the balloon was full with air, the child accidentally turned it loose. Manning, who was idly watching the actions of the little fellow, saw the balloon shoot high into the air and fall several yards away.

"What a dumbbell I am!" he exclaimed aloud: "Not to have thought of the rocket principle before now."

With this in mind, he designed the strange craft in which he hoped to catch the "Flying Dutchman" of the air. The same aircraft corporation that had built the *Mercury,* Robert Manning's first ship, constructed the *Skyrocket,* the masterpiece of Richard Manning. It was designed on a principle which, in the '30s, had shown great promise; but had then been side-tracked and forgotten, because of the difficulty of obtaining the enormous power required.

Under the personal direction of Manning, the new plane grew rapidly and, with an army of workmen at his disposal, in comparatively short time he had it completed. What a beauty it was to be; graceful as a gazelle yet sturdy as an elephant, incorporating a radical change from the now usual type of combination dirigible and airplane. All excess weight was eliminated, and the body was built very slender, resembling more a needle than a torpedo. All the protruding edges, such as those of the planes and stabilizers, were stream-lined to an exceedingly high degree. Through the center or core of the hull, from stem to stern, ran a large tube constructed of layer after layer of pure *manoleum.* In this huge tube were located, and operated by means of electrostatic motors, the gigantic fans which were to draw in air at the nose and blow it out at the rear. Although this scheme necessitated an enormous expenditure of energy, Manning believed that the centralization of power and the double action of the fans would greatly increase the speed and efficiency of the machine. As shown in the model and, later, as shown in the ship itself, this proved to be true.

One morning, when the new ship was almost finished, Manning received a radiogram which again nearly distracted him. It read: "Richard Herrick was instantly killed this morning by an explosion." Unknown to Manning, who had been so busily engaged, Herrick had returned from Asia. While working in his laboratory, Manning learned, something that Herrick was mixing had exploded; killing him instantly and disfiguring his face, especially, beyond recognition. When Manning gazed upon the torn body of the older scientist, he could hardly believe that it was indeed that of the man who had been a second father to him; but the figure of a dragon tattooed upon the right arm, above the elbow, excluded all doubt of his identity.

The second tragedy, coming so close upon the first, had nearly the effect of sending Richard to join Huntington; but, somehow, his iron will dominated, and, after Herrick had been laid in his last resting place, the younger scientist continued his work from the point where it had been interrupted.

When the great plane, which he had determined to name the *Skyrocket,* was in the last stage of completion, Richard began to gather around him a carefully

selected crew to man the craft. Just by chance, he succeeded in procuring, as his chief officer, the former captain of the *Ambassador*, who had recently resigned from the service of the lines. With such a man in charge, he believed the chances of success in the hunt were greatly increased. The other ten of the crew were clean-limbed, brave young fellows—each of whom was an expert pilot, and each of whom held a commission in the Air Reserves.

The day for testing the new ship arrived. It was rolled from its cradle in the hangar and the motors tuned up. Once again, as the marvelous structure lay there glistening in the morning sunlight, each vital part was gone over, the static supercharger was tested, the motors were adjusted, and the other mechanical parts were checked.

At last Manning gave the word to be off. The motors hummed and, like a feather wafted aloft in a breeze, the *Skyrocket* sailed into the sky.

"Forward!" ordered Richard, when an altitude of two thousand feet had been reached, and the ship, with a hiss, leaped forward like the device for which it was named.

Almost like one gone stark mad, Manning put the *Skyrocket* through a more grueling set of paces than had ever before been employed in testing a flier of that size. Quick turns, vertical climbs, nose-dives, side-slips, all of which would have snapped an ordinary plane in two, had little or no effect upon the sturdy *Skyrocket*. At last, Manning ordered full speed ahead, and the plane shot forward on a straight course. Slowly, as the craft gained velocity, the speedometer crept up; three hundred miles per hour, four hundred, five hundred, six hundred, and so on until it stood almost at six hundred and fifty!

Manning was extremely pleased with the performance of the *Skyrocket*, and began immediately to lay his plans for catching the *Phantom*. As a result, three days later the *Skyrocket* again left its hangar; the hunt was on.

CHAPTER V
The Hunt

FOR fully a week the *Skyrocket* combed the wildest portions of the globe in search of the *Phantom;* but no signs of the strange craft were to be seen. Back and forth, over the western deserts, swept the graceful *Skyrocket*, while sharp eyes scanned the blistering sands below, searching—ever searching—for the smallest clue that might give an inkling as to the whereabouts of the *Phantom*. From Alaska to the South Sea Islands, the hunters scrutinized sea and land; but without success.

All this time life aboard the ship was very pleasant. The huge electrostatic motors worked better than Manning had even hoped; day after day they drove the graceful flier forward without once faltering. After the motors had been sufficiently broken in, Manning decided to ascertain the maximum speed of his new craft. When the rate of 1,000 miles per hour was reached, the throttle still lacked a few notches of being wide open.

One day, as they were rounding the side of a mountain, on the eastern slope of the Andes, they came face to face with the *Phantom!* Although only once before had that craft been seen in daylight by those who lived to tell the tale, not a single man on board doubted that the sharp pointed torpedo-shaped flier was the one they had been seeking. On the appearance of the *Skyrocket*, the *Phantom*, instead of attacking, veered round and raced away to the south; the *Skyrocket* was instantly in hot pursuit.

Half-way round the world the chase lasted. Time after time the *Skyrocket* crept up almost within gun-shot of the black quarry; and then the *Phantom* would put on a burst of speed and draw away. For days the most terrific race in history went on. The *Phantom* was desperate, fleeing for its life; the *Skyrocket* was fighting to make the world safe. Time after time, the men aboard the pursuer felt peculiar electric thrills pass through their bodies. The *Phantom* was using its long-range weapon, the engine-paralyzing ray; but it had no effect upon the electric motors of Manning's ship. The men on board the *Skyrocket* were beginning to tire of the chase when fate, in a playful mood, stepped in and allowed the *Phantom* to escape. In other words, while the chase was in progress, among the East Indies, a terrific tropical thunder storm blew up. The supercharger on the *Skyrocket* became highly overloaded and, although nothing of a serious nature developed, the hunters were forced to abandon the chase for the time. The *Phantom* had apparently dissolved into thin air.

To say that Manning was disappointed is to put it mildly; but with the never-say-die spirit that he possessed, he proceeded to cruise back and forth over the thousands of islands that dot that portion of the sea.

Two days after the escape of the *Phantom*, they were drifting over an isolated island of considerable size, about two hundred miles south of Java, when the captain shouted, "Look!" and pointed earthward. There, in a clearing, lay the *Phantom;* the chase was over!

Manning was for dropping down and attacking the quarry on the spot; but the captain, who was still suspicious, convinced him that it might be a trap and that, possibly, the best thing to do was to act as though the *Phantom* had not been observed, land at some convenient place, and scout back on foot to determine the lay of the land. So they landed and Richard, much against the will of the captain, went scouting alone.

"I'll be back in half an hour, probably," he said, "but if I am not back in an hour come after me."

Away he went into the jungle and, after five minutes of fighting his way through the underbrush, arrived at the edge of the clearing. He lay on his stomach behind a bush and sized up the black ship; it lay silhouetted against a red sandstone cliff that rose perpendicular, directly behind it.

His observations were suddenly cut short by something landing on his back. Nearly all the wind was knocked from him and, before he could so much as raise a finger, he found his hands securely tied with a piece of tough vine, and his arm being held in a grip like a vise. His captor proved to be a gigantic Malay, the largest man that he had ever laid eyes upon, who stood at least seven feet in height and must have weighed fully three hundred pounds. The giant was naked to the waist; but a pair of dirty duck trousers covered the lower portion of his body. A greasy red-and-white turban wound round his head completed his scanty attire.

"Uga!" he grunted, pointing toward the *Phantom;* and, to make his meaning more clear, he gave Manning a shove forward which nearly sent the latter sprawling.

Half-dragged, half-carried, Manning was taken aboard the ship of mystery which he had so long pursued. Down a dimly-lighted and heavily-carpeted

corridor he was hurried, and through a heavy door at the end. He found himself in a softly-lighted luxurious room which served as the office, no doubt, for that fiend who ruled the *Phantom*. The furnishings, the atmosphere of the place were undoubtedly oriental; The heavy drapes which hung around the room were Chinese, and the divan with its many pillows was purely Persian. One who had read of the mysteries of harem life, as they are pictured to the Western reader, might well have expected to see some scantily-dressed beauties reclining on the large divan. If so, great would have been his disappointment; for the only person in the room was a masked man, who half sat, half reclined, in a large easy chair behind an exquisitely carved ebony desk. But the thing which struck Richard as being most extraordinary was that the man of mystery seemed to be a prisoner on his own ship. He was fastened firmly, to all appearances, by several strands of heavy silk rope which circled his body and which were doubtless secured in some manner to the back of the chair. Richard immediately suspected the hooded individual of being the same person at whom he had shot on the *Ambassador*. At least the hood and cloak, the form, were identical; whether or not it was the same man, he could not be sure.

For a moment after Manning and his captor entered the presence of the masked man, no word was spoken; but he could feel the fiery eyes behind the mask burning into him. Then the master of the *Phantom* spoke in a not displeasing voice, his English betraying an undefinable foreign accent:

"Ah! Meester Manning, welcome to Galon; we have been expecting thees visit and eet ees endeed a pleasure to receive such an eemportant person. Eet ees rare that we have veesectors." He paused a moment, then grunted something to the giant Malay; and Manning had the satisfaction of feeling his bonds being loosed. Before he could follow his impulse to do something of a violent nature, however, he was propelled backward by the huge Malay and landed sprawling in an easy chair.

"That ees much better, Meester Manning," said the hooded figure: "Now be calm, and we'll talk business."

Manning became as docile as a lamb; the Malay stepped across the room and stood by the door.

"A sweet time I would have passing that gorilla!" thought Manning; "I must think fast."

Back from the Dead!

ALTHOUGH he appeared to be the picture of meekness, his brain was moving like lightning. Suddenly, before the huge Malay could realize what was happening, Manning was out of his chair, like a flash, was across the room, and had torn the hood from the head of the *Phantom's* master. When he saw the face thus revealed he stepped back aghast. His face turned deadly white, a gasping cry gurgled in his throat, and the black hood fell from his nerveless fingers. The man who sat in front of him was Richard Herrick, come back from the dead!

Manning sank into a chair and buried his face in his hands. What turmoil raged in his breast. To think that the man who had been his best friend, and whom he long believed to be dead and buried, should prove to be that hated fiend of the *Phantom!* Silence reigned in the room. Even the giant Malay who had sprung to Herrick's assistance seemed to feel the tenseness of the situation, for he stood gazing at his master's face, now twisted with many emotions, on which he was looking for the first time.

Herrick was the first to break the silence: "Richard, my boy, do not judge too hastily." He paused, the young man did not move.

"Will you please forget for a moment that I am the 'Phantom' and listen to me?" There was no answer: "For God's sake, Richard, you must hear me!" exclaimed Herrick frantically.

Manning raised his head,

"I will listen," he said slowly and in a voice choked by emotion, "but what can you say?"

"Thank God," breathed the "Phantom," sighing with relief: "in half an hour all will be explained and Herrick will then be ready to join his fathers on the banks of the Styx." He leaned back in his chair, and after gazing vacantly into space for a moment, he began:

"Years ago, when you were but a lad, your father and I were working together one day in the workshop. An iron bar which hung suspended above us suddenly came loose, struck me on the head, and knocked me unconscious. The blow did not prove very serious, but your father insisted that I see a specialist in order to be sure that everything was all right. I consulted a noted authority on the brain; he took X-rays and told me that there was a slight dent in my skull; that the bone was pressing slightly on the brain, but that it did not present serious danger.

"'Nothing will come of it,' he told me, 'provided you lead an active outdoor life and never allow your brain to become fatigued. But, if you fail to carry out these simple instructions, the pressure on your brain as it fills with blood may cause mental derangement!'

"So, during the years that followed, I tried to lead a normal life, and trained you along the same lines. With pride I watched you develop into splendid manhood, and had nearly forgotten the incident of the iron bar, until a few years ago, I began to perceive queer ideas that filled my mind at times, yet quickly passed away. But the ideas returned with renewed force, despite all that I could do. A great fear clutched me, and I consulted specialist after specialist. All recommended different things, but the main thing was to occupy my mind with happy thoughts. But, as these ideas gained force in my mind, my own doctor at last sent me to a private sanitarium; but I hated conditions there. A different spirit, a cold-blooded cruel mentality seemed to have taken possession of me. I was becoming a regular Mr. Hyde.

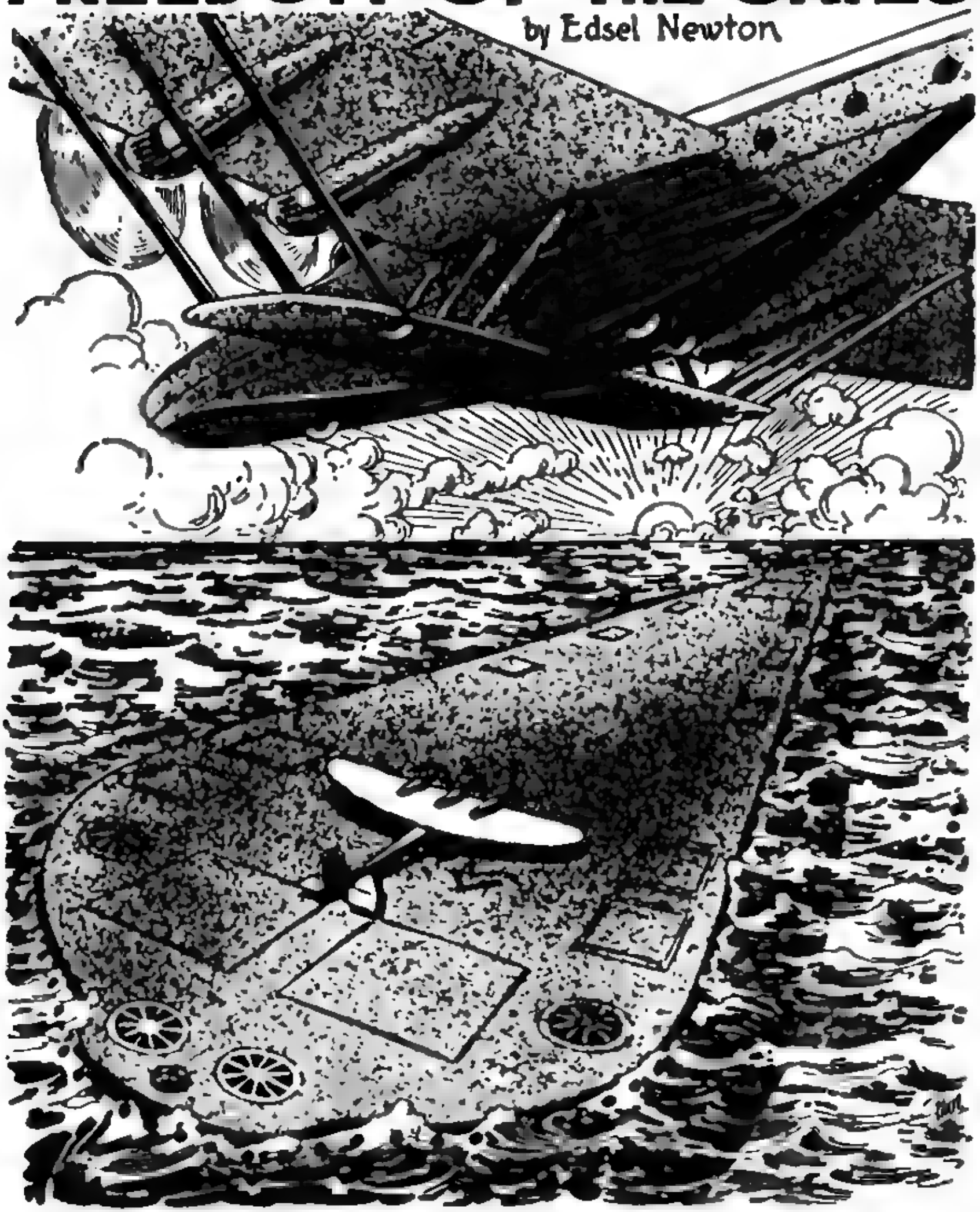
"One night I escaped, returned home, and then departed for the West. You know what happened then. I wandered like a lost soul all through the Orient. Every day I could feel my other self, the demon, slowly consuming the good in me. God! I wanted to die; but I was afraid.

"In my travels I landed upon this island, Galon, made friends with the natives, and started my devilish work. Here I discovered the secret of my paralyzing ray; learned that by means of this ray I could create a vacuum in the air at a distance or, by shortening the wavelength, paralyze a gas engine. The ship that I built works on the simple principle of atmospheric pressure; by means of the ray I exhaust the air in front or above the craft, and the air pressure on the opposite side pushes it into a vacuum. The principle is simple, but the atomic ray is too dangerous for human weakness to possess. For the safety of mankind, no one else must ever learn that secret.

(*Continued on page* 556)

FREEDOM OF THE SKIES

by Edsel Newton



(Illustration by Paul)

The smaller ship continued to spiral and lose altitude until she levelled off for a minute and then silently slid toward a flat curtain that was almost level with the sea. He was approaching what seemed to be a great floor, floating upon the surface of the Pacific.

IT was a bright day in early June of the year 1974. A young man was standing in the archway of the main passenger entrance of the Grand Central Air Terminal in Los Angeles, absently fingering a new pilot captain's cap, which had been presented to him but ten minutes before. Yet, where the flush of success might have been expected in his looks, his face was pale and worn; and in his eyes there was the light of tragedy. He was suffering in agony, unknown to his fellow pilots; and when one of them came quickly out to grasp his hand in congratulation, tears flooded his eyes. "Please, Joe—I —I can't stand it if you do! It doesn't mean anything now but—but oblivion."

The captain for whom he had been pilot-mate for several months looked into those dimmed eyes, amazed: "For God's sake, Fred, you can't mean that—not with a new commission as passenger-plane captain. Why, I don't understand. Won't you tell me?"

"Don't make me talk, Joe, if you're my friend. Just go in there and tell the dispatcher that I'm ready to fly the cargo plane to Guayaquil. Don't make any excuses for me—just tell him I said I wanted to make my first trip as pilot-captain alone."

"You're a queer bird, Brettner," said Joe Blaine. "Why don't you tell him yourself?"

Brettner was nervously impatient. "I can't! If I did I'd jumble up the whole works. I can't talk—but I've got to make the trip alone. If I took the passenger plane I'd go crazy."

Blaine made a mumbled remark about the freight plane being so much harder to handle; but he hurried back into the office, prepared to argue for half an hour in the cause of his friend.

* * *

Ten minutes before this conversation began, Fred Brettner had stood before the inspectors of air-pilots and had taken from their hands the papers which authorized him to assume the responsibility for any ship on any line of the great International Airways. And, now that the great moment had come, it meant nothing more than an opportunity to get away from the scene of what was to him a tragedy. The latter had come about in a manner so common to airmen of his day. Up from Shanghai, as pilot-mate on a fifty-place sesqui-amphibian, he had played the hero to a girl. Her name was Nadia Deneen, and she lived in the city where Fred had lived, and she loved the things he loved; and so, through those long months, she had made his between-cruise hours so infinitely worth while that he lived exultantly.

ROBERT STEWART

"I can't! If I

A Sudden Departure

SHE was sweet and clean and clever, a brunette, with hazel eyes that smiled out to make his own world seem to smile back; life had then indeed been sweet. He had once rescued her from beneath the blown-down door of a hurricane hatch, while Joe Blaine was piloting the big amphibian through a storm, and a hurrying steward had closed the door without looking out on the promenade deck for passengers. The steward had not reckoned that there are yet in the world daring spirits who might stand dreaming in such a place, whether or not the ship was making dizzy banks and turns through the terrible currents of air above the mid-Pacific.

After the rescue Nadia had never forgotten. She had, apparently, taken the advice of a well-known writer and consented to let him marry her, in recompense for having saved her life. She did succeed in making him the happiest man in the world, even to agreeing that he should continue with his career in the air. They were to be married the day he should become a pilot-captain. And they had planned to live near the terminal, where she could meet him each time he put down after a long hop from the far places of the earth.

One cannot describe love. When it has come into the heart of a sincere young man, its end is always a tragedy. That Fred Brettner, sensitive, as high-strung as a fine racehorse, as imaginative as a poet, should have lost Nadia Deneen's love after having known it was a pity. He had nothing else left. The turmoil in his soul was too poignant to be suppressed. He had gone to her home that morning, the day of his triumph, which he was to share with her—and he had found only the maid who gave him a short note, which he would ever recall as bearing the statement that she had gone, never to return.

She had lived alone with her servant. There were no relatives to whom he could appeal for help in locating her. It was a soul-stirring mystery that had struck a vigorous young man of twenty-three, and in twenty-four hours his face had become seamed like that of a man of fifty. There was absolutely no reason why Nadia should have ended their beautiful relationship so abruptly. It was not like her; and yet it had happened—it was real! He tried to shake off his mood, as Joe Blaine returned with the verdict from the dispatcher, who had granted Brettner's request to make the Guayaquil freight hop alone.

AS time goes on, aviation experts as well as statesmen are coming slowly but surely to the realization that aircraft will some day change the face of this earth. With automatically controlled aircraft, explosives of tremendous strength that can be hurled from airplanes, and misguided ambitions of unscrupulous men—there is a picture that may well give us cause for concern.

It has been demonstrated in the past that a few dozen airplanes can lay desolate the largest of our cities, and if such airplanes are in the hands of unscrupulous persons, the havoc can well be imagined.

It is to be hoped that, as in all evolution, effective counter measures will be found in due time that will checkmate the efforts of irresponsible or too ambitious persons. That such a solution may be needed badly, the present highly exciting story clearly shows.

He went back once more that morning to Nadia's home, hoping against hope that she had returned, that her message to him was all a dream. Not finding her there, he turned back to the terminal and his ship, gathered his clearance papers, and soared away. Nor did he see, in his preoccupation, a strange little man with a wizened face and eagle eyes, who observed him intently as he made his way to the controls of the great ship and sent it upward from the field.

And, for any curious observer who had followed the little man, the only significance would have lain in the fact that, upon the clearance of each ship that morning, for whatever port in whatever country, this man had returned to the cockpit of a long-range pursuit-plane nearby on the field and tapped out a message in radio code.

Strange Events

WHEN Fred Brettner had taxied down the field and lifted the big freighter from the ground, he felt somewhat relieved. Her five motors spurting flame from the exhausts, the singing of the wind through the braces, and the thought of the long trek to Guayaquil, Ecuador, all helped to stifle the turmoil in his heart. But, after five or ten minutes of the journey's monotony, he thought of Nadia again. How could she have left him at the moment when all their plans were to have been consummated? It was mysterious.

The maid had merely found the note and given it to him; she knew nothing more about it, and had no knowledge of Nadia's whereabouts.

He lifted the ship higher and gave her full throttle. He tried to quiet his nerves with a cigar. But no, nothing would change him now. He would have to forget. Life shouldn't be a tragedy to a man, just because the girl he loved had seen fit to part from him. The experience would be all the more worth while when he had conquered the weakness in himself which caused him to view it as a tragedy. And yet, how could he forget in an hour? He steadied himself and chewed his cigar. Nadia's face seemed reflected in the cabin window; he slid the glass over to one side and breathed deeply of the inrushing air. He could never forget; but a pilot must go on. If he had known a reason for Nadia's sudden departure—if anything had happened to separate them, he felt that he had a right to know it. But there had been only the curt note: —"and please forget me entirely—I can't explain—Nadia." And the motors of the great ship sang a weird song to a heavy heart.

* * *

Five minutes after Fred Brettner had hopped off for Guayaquil, Joe Blaine, senior pilot-captain of the International fleet, ordered all passengers aboard and lifted his big amphibian off for Shanghai; the usual song in his heart stilled only by the sudden mystery of his former mate's actions. Thinking it best to wait till another time before questioning Brettner, Blaine had decided to make the best of matters. Safely on his course, he turned over the controls to his new pilot-mate and went aft toward the passenger quarters. As he passed the door of the radio room, a thought occurred to him, and he went inside, to find the operator frantically working over the set. Upon questioning the young man, Blaine learned that the conduits carrying the wiring from the air-driven generator had been gutted. He poured questions at the operator: "You're sure you didn't order the repairers to have them disconnected for replacement? Why didn't you test the set before we lifted? Who would disconnect our wiring?"

"I don't know," said the horrified operator. "I only know the jinx has the whole fleet that left the terminal this morning. Metzler, who took the morning express to Seattle, was ill when he took off, and he didn't know what was wrong with him. He didn't say anything about it—"

"What has that got to do with our generator leads?" interrupted the captain.

"Nothing," answered the operator miserably: "Only it won't help us. It will take considerable time to insulate makeshift leads in this emergency. What gets me, captain, is that anyone should tamper with the leads. We've got to watch out—there's something afoot!"

* * *

After the long-flight traffic that cleared from the terminal that morning—the International Airliners that went out to the cities of the world in an ever-increasing, romantic race for trade—a long-range pursuit-plane left the great airport and swung over to a small landing field some fifty miles distant. Its only passenger was the little eagle-eyed man with the wizened face who had been so interested that morning whenever a plane left the terminal of the International. But, when he landed at the other field and taxied over to the only hanger which was open at that hour, it was only to take on, as an unwilling passenger, Nadia Deneen, sweetheart of Fred Brettner! That she resisted being put aboard the craft was evident from her muffled screams and attempts to pull away from her strong-armed keepers.

"I'd 'a given her some dope, only we've got to have her awake," said one of the men. And the wizen-faced pilot nodded assent as he shoved the throttle full out and took off. At ten thousand feet, he leveled off and steered a course southwest across the Pacific.

CHAPTER II
Brettner Reflects

THROUGHOUT the morning, the great Guayaquil-bound freighter was sliding onward toward the tropics. Fred's mood had changed; he was thinking about the world he had left beneath him—new in ideas, but as old as ever, and never truly sensible after all! Though he was living in a day when marriage was seemingly, no longer the mode, he himself was still old-fashioned and conservative; and he had thought himself fortunate to meet a girl who did not care for the new freedom demanded by so many of her sex. And, now, his dreams had been rudely shattered.

Love was the greatest problem of life as it had been with so many others since the beginning of civilization. In these days men were working for the love of work; the ideal of Social service had become a reality. Work was a matter of serving the community and, therefore, common co-operation had facilitated it in every way. In fact, the outer aspects of life had been so simplified that the only great problem remaining was that of love, the world-old problem; and there is no such thing as a logical solution of this.

And now the greatest blow that could come to a man had hit Fred, and he was trying to think his way out. He was still in the stage when youth must analyze and try with all its might to master itself.

He reflected again. Back in the dark days of strife in 1930, for instance, his grandfather had been one of those daring souls who piloted planes continuously to

Singapore. The old man could now remember several instances when he had left Los Angeles with a feeling that he would never return; but by sticking close to the controls, he had managed to avert the disasters his intuition foretold, and had flown his ship through. And, if his grandfather had accomplished that with all the worry entailed by gasoline engines and the possibility of dead motors, the distractions of navigation and such details, he himself could certainly fly a modern perfected plane to Guayaquil, however heavy his heart.

But he was not long given to such reflections. For, two hours after his leaving the terminal, a pursuit-plane drew alongside and nosed up to attract his attention. He looked her over; for a moment he wondered why the plane should be so close. Then a hand shot out from the forward cockpit and waved to him. He banked his ship over to get a better view. When he did so, he saw Nadia, her face pale and frantic, making terrified gestures to him! It looked as though she were telling him to stay on his course and not follow. But he knew he must follow; one look at the face of the pilot whose shifting, steely eyes glared in his direction, and Fred Brettner made his decision.

The pursuit ship climbed steadily, and Fred followed. Sixteen, eighteen, twenty thousand feet—and still up into the clouds they sailed. He wondered why the pilot of the little plane should want such altitude. But it was not long before he was to know. When the pursuit plane leveled off, its pilot shut off his motor and motioned for Fred to do likewise. Then the pilot yelled to him: "If you want this girl to live, you'd better follow me!"

That was all he said. He did not give Nadia a chance to talk; instead, he turned about and headed westward over the Pacific. Whereupon Fred Brettner gave his five motors full throttle, and stayed close behind the other plane.

He searched his mind for possible reasons for this strange manner of abducting Nadia. What could this sinister pilot want of him? He could not pay ransom, for he was not a moneyed man, but only one of the masses. Why, in the name of Heaven, should anyone resort to this method, to any method of breaking up the happiness of a young couple who in this advanced day were clinging to conservatism, to the traditions of finer, higher-minded people? It had all come so suddenly that he had not thought of his radio transmitter. He reached for the switch and turned on the air-driven generator. His first thought was an "SOS" message; but when he clamped down on the key it was dead. No vacuum tube glowed. He was helpless to tell the world of Nadia's plight.

Captured!

AFTER three hours of flight, during which time Brettner's mind had been considering a hundred possibilities of what was happening, the pursuit ship throttled down slowly and nosed downwards, Fred following her with his heavy cargo plane. He looked below, but saw no sign of a landing place in the limitless expanse of water. However, the pilot of the smaller ship continued to spiral and lose altitude, until she leveled off for a moment, and then silently slid toward a flat surface that was almost level with the sea. He saw the plane make a perfect landing, and then himself circled for position to do likewise. Then he realized that he was approaching what seemed to be a great floor, floating upon the surface of the Pacific. He slid the big cargo carrier down upon it, and taxied up behind the pursuit ship, at the side of which were now waiting Nadia and the pilot. When he had cut his motors and hurried out of the cabin to join them, he was met by two men who, it seemed, had suddenly appeared from nowhere. They took positions on either side of him, each seizing one of his arms in a tight grasp. "Any discussion must be with the Grand Master," said the one on his left. "You are ordered not to ask questions concerning your presence here until you are before him," said the one on his right.

Brettner's only concern was for Nadia. "Can I see the girl first?" he asked.

His escort on the left nodded and turned with him. The pilot of the pursuit-plane had pressed a button which opened a huge trapdoor, into which his craft was wheeled. Nadia was left to join Fred and the two men. She hurried to him, her large eyes filled with tears. The guards permitted their embraces.

"Fred, what can all this mean?" she asked. "They came to my apartment and forced me to write that awful message to you—it wasn't true!"

"We'll have to make the best of it," he whispered. "It looks like a big kettleful of devilment to me. I suppose they took you in order to make me follow. They couldn't steal our planes from the hangar—they want the cargo, you see. It's been hinted about that a cargo plane is always in danger—especially when it carries valuable electrical and chemical apparatus, as mine does."

"But isn't it dangerous—will they let us live?"

"Please don't think of that. They won't harm you, or me," he said with assurance.

"But they won't let us go back home; they will be afraid we will reveal their rendezvous."

Fred looked around the island-like structure: "Apparently they can move it. It has the color of the sea, when you look at it from above, and it would be hard to locate."

One of the men stepped between them:

"The Grand Master will receive you below in three minutes," he said, almost pleasantly.

They followed the guards down through a hatchway and into an enormous compartment. "This thing cost enough to build to keep a thousand people in luxury for the rest of their lives," commented Brettner: "The 'Grand Master' must have fabulous riches."

"That need not be true," Nadia reminded him: "There may be a thousand of them in partnership."

"I think your deductions will not be borne out," said Fred and stopped. They were soon following the guards through a hallway and into a reception room. They looked for an instant down another aisle which extended for what appeared to be the length of a city block. The ship, or whatever it was, appeared to have the deck surface of five of the large battleships of fifty years before, but whatever went on within it was still a mystery to them.

Presently a door was opened before them, and before them stood a tall, well-built young man, apparently about twenty-five, dressed in a one-piece suit of black velvet with a sash about his waist. His face was expressionless, and its paleness gave it a waxen appearance; but there was a ringing quality in his well-modulated voice: "It is my duty to warn you to speak the whole truth in all matters pertaining to yourselves. Then, only, will you be allowed the freedom of the decks, and avoid harm to yourselves."

"He's just the man I want to see," said Fred. "If there's anything personal about this I want an oppor-

tunity to state my side of the case."

The Grand Master

THE orderly turned and walked away without reply. He went to the door and opened it, motioning for Fred and the girl to follow.

"Be careful what you say, Fred," cautioned Nadia.

"I want to know why you're here," Brettner said decisively: "That's my first question to fire at this Grand Master. I'll bet he's one of those Napoleonic eccentrics, like certain capitalists of post-war days who are said to have possessed such a complex for power."

Nalia laughed, even her eyes twinkled: "If you didn't have a sense of humor I'd feel blue," she said.

"But it's true," muttered Brettner. "Think of it—kidnapping you!"

The two young people were ushered into an immense room which was lined with blue and golden tapestries, with elaborate furniture everywhere, about a large desk in the center. There were multi-colored lights spaced upon the walls, and their reflection gave the place a weird atmosphere. At the desk sat a young man, apparently no more than thirty, with keen blue eyes, blonde hair and the form of a Greek athlete. He was dressed, as were the guards, in a one-piece suit of velvet; but he wore a silver crest, the top of which consisted of an eagle with wings spread to the winds.

The orderly silently placed two chairs before the desk and motioned them to be seated; then he disappeared through the door and it closed. When Fred and Nadia had seated themselves, the man at the desk spoke in a rich, deep voice: "You are before the Grand Master of The Conquerors of the Skies," he began: "When I say the 'Conquerors of the Skies,' I refer to the most powerful organization in the world. Our aim is to control the air; suffice to say that we are assured of success. You are now within our citadel, which is the largest submarine structure ever built. It can be submerged in eight minutes. Our methods of action, at present, are confined to the demoralization of the pilots and crews of the International Airliners." The Grand Master paused and smiled: "My men have disabled the radio instruments on all liners passing within five hundred miles of our position. This vessel is a floating nation—we call it Marino. Marino shall conquer the world.

"Now, Captain Brettner, our reason for abducting your sweetheart, was to ensure the presence here of this young lady while we are gaining possession of an added number of ships."

The Grand Master paused. Brettner's face was suddenly a livid white; he understood that Nadia was to be held as hostage for some infamous purpose. The words of the Grand Master ate into his soul. And he must see her suffer for the greed of such a man as the one sitting before him! He wanted to fly at the throat of the pirate, but instead he turned suddenly in his chair and hoarsely whispered her name, "Nadia—Nadia—My God—you!" Their eyes met, two pairs of richly-tinted pools with everything that they held worth while reflected in them. They could not speak. Only the fortitude of the girl whose eyes met his gave Brettner courage to look again at the Grand Master. The latter smiled.

"It isn't such a tragedy, Captain Brettner. You shall not be deprived of the society of this young lady. I give you my word of honor that Miss Deneen shall remain unharmed, with the freedom of the decks, as long as you obey orders. I don't want *her;* I want *you!*"

"May I ask why?" demanded Brettner.

"I thought it was obvious," smiled the Grand Master: "I shall make it clear, however. You are to return to the mainland in a ship piloted by one of our men. You are to tell the officials of your company that you lost the ship by accident and that you were rescued by this man. Meanwhile, Miss Deneen remains with us as security for your loyalty to us.

"One of my pilots with a light amphibian monoplane will take you. Upon your arrival in Los Angeles, you are to make only the necessary explanations; and when you get command of another plane —a cargo carrier— you will fly her here."

"And if I refuse?" At his words Brettner felt Nadia start. Before the Grand Master could reply, she spoke: "You mustn't give yourself to dishonor for such as this, Fred—I'll—I'll do anything before you shall!"

"You will be wiser not to refuse," said the Grand Master: "If you agree, and then betray us, our detective force, which covers the movements of every one connected with the International, will discover it. Our agents are everywhere. You must consider. Why, if this young lady consents you may even be married aboard—we have a chaplain—and live in luxury with us indefinitely. We can always use you, captain. Your knowledge of air craft will enable you to bring a great number of planes to our decks. And, after we have accumulated enough additional supplies from cargo planes, we shall put our forces in motion for a conquest of the world."

"Why didn't you buy the planes at first, and save yourself the expense of building this great ship?" asked Brettner, intrigued by curiosity.

The Grand Master still smiled:

"We had to have headquarters, captain! We knew that, in order to maintain an immense number of airplanes, we would need a hiding place. The land portion of the world—that which is comfortable—is now entirely within the scrutiny of adventurous airmen. I know of no place outside the frigid zones where one could be so secure as we are here in Marino. You must remember we are a nation; and, as a nation, we are going to conquer the world. This meager start of ours is only to secure airplanes and supplies.

"We have ten thousand pilots, all belonging to the Order—all ready upon an hour's notice to come aboard. As fast as we capture the ships of the International, we have men ready to assume command of them. We have marked out immense stores of explosives in the different parts of the world, which will be picked up by our planes, swarms of them, when we are ready.

"No, we are not cutthroats, Captain; but we are determined. We need more than the hundred ships which we have aboard. We want ten thousand—enough to cover all the cities of the world—and all the high explosives available. We must work fast, yet with care. Therefore, my final word to you is: If you wish to see Miss Deneen live happily—or live at all—follow my instructions to the letter!"

CHAPTER III
Brettner Meditates

THE two young people gasped. The Grand Master nodded and pointed to the door: "Go," he said, still smiling to himself.

At the last word of the Grand Master, a guard entered the room and guided the two captives through another door into the great aisle. There they met another men-

ber of the Order, who told them to follow him. Several hundred feet farther down, the man stopped where the corridor was lined on either side by a number of doors; he opened one of them.

"This is the room of the young woman," he said. "She will enter here and make herself as comfortable as possible. Five minutes will be given the captain to say 'farewell'; and then he must accompany pilot and plane No. 78 to the mainland."

The two young people immediately forgot the presence of their guard. But there was no time for them to discuss a possible plan of action. Unashamed they embraced, and Nadia whispered: "I'm afraid I'm costing you your honor—your life, Fred!"

He kissed her: "It's worth it!" he said. He held her close and thought hard for a moment. No idea of escape coming to him, he thought of her welfare as a prisoner. "Remember the old formula, dear—let us live in the memory of our love, no matter how unpleasant our path."

She sighed: "You always thought of things, Fred. "You'll—" she lowered her voice to a whisper which only he could hear"—you'll find a way out of this, too!" Whereupon the guard took his arm and ordered him to depart.

Brettner, in order to leave Nadia there in the doorway of her quarters, had needed all his will-power. The whole affair was so contrary to every ideal he had cherished—freedom, love, the inheritance of every American to live without slavery and without force! And now a daring act of piracy had placed him in this situation!

He must find some way to combat this Grand Master and his wild dreams. He wondered curiously why the Grand Master should wish to conquer the world; why, in fact, any one should be so greedy. And yet, as he reasoned further, the Grand Master might possess ideals of his own. Perhaps the ruler of this floating kingdom wanted to reign over the entire world, so that it might attain even greater civilization and progress. But again, why should he set himself up as the arbiter of the world's destiny? There was little suffering at least in America. Nor was the age-old cry of misery now ringing from the lips of the newer and finer generation of Europeans. Prosperity, throughout the world, had been brought about by a great program of cooperation between individuals and nations, all of whom had realized that this planet is small and that the happiness of all means the happiness of each individual.

Now, in this age of peace and plenty, there had arisen the spectre of this gigantic piracy——

He was walking along the decks, escorted by the guard, when his mind came back to the reality of what he must face. The Grand Master meant business. Many millions of dollars had been expended in this submarine structure alone, how many millions he could not calculate. It was an immense thing, occupying an almost inconceivable space in the water. It was so built that, when it came to the surface, only the decks were visible. The remainder of the ship was under water, but he saw that it was almost indestructible by attack from the water. It had thousands and thousands of compartments and watertight doors. It contained immense machine shops and dynamos, and that newly-conceived apparatus for the taking of motor fuel from the different elements. Power? If appearance did not lie, the Grand Master had power; if his assertion were true, that ten thousand pilots belonged to his Order, he had enormous power; for no nation on earth had possessed more than that, since war had vanished from the earth. And now, in place of international war, a powerful individual was arising to menace the earth.

Another Capture

ON his way up to the surface, Brettner saw hundreds of men and many women carrying on the multitudinous details of life, and all apparently happy in their surroundings. At first he had believed that they, too, were fanatics carrying out the wishes of a fanatical leader. But their cheerful industry and efficient manner of carrying on their life astounded him. The guards, who appreciated Brettner's astonishment, seemed to feel the chasm between them; for there was not an unnecessary word spoken.

Presently they arrived at a great opening that led up to the deck. Here the sun shone in, and here and there were the great lead-covered cables of the sun-power converters. As Brettner learned, the sun's energy was being converted into electrical energy which was stored in great batteries to be used during days of the inevitable fog. They climbed the stairs—ladder, in the language of the sea—and emerged upon the huge deck. A large plane was sliding down for a landing, and another of the pursuit-planes preceded it. As the large ship came closer, Brettner recognized it as a big trans-Pacific passenger liner of the International. And, as he made out the ship's number, he gave a start; for this was Joe Blaine's craft.

When the ship had finally landed and taxied into position near the hatchway, Captain Blaine emerged from the gangway, under guard, and looked about him, with bewilderment written on his face. He saw Fred, gave a start, hurriedly started toward him. The guards intercepted them.

"For God's sake!" said Blaine excitedly: "Was this your game, Brettner, when you asked for a cargo plane? And you are in with that gang of pirates that disguised themselves as passengers and seized my ship!"

The guards motioned their prisoner away.

"No, Joe," Brettner answered quickly: "I'm as innocent as you are. I wanted that cargo plane so I could be alone, but I discovered later that these people had abducted my sweetheart. I followed them, and was taken here."

"Good Heavens!" gasped Blaine. He was silent for a moment. "Sorry, old man, I was so hasty!" The guards were forcing him down the ladder. Brettner waved at him and turned to his guard: "I'm ready now," he said simply.

Presently a small amphibian plane was wheeled from the elevator, and a pilot came out to tune up the motor. He called Captain Brettner to enter the cockpit. Fred climbed in, the plane rose and they were off on a zig-zag course in the general direction of the California coast. This wavering flight was, evidently, the ruse which Marino's flyers used to cover their tracks. Six hours later they slipped into a small, unpretentious airport, a few miles from the Grand Central Terminal. When the plane had landed, and the motor was cut out, the Marino pilot said: "You're to phone and tell your headquarters that you crashed on the mountains in a fog, and that I rescued you." Brettner picked up the instrument and, dialing his office, spoke to the superintendent, repeating the story which had been prepared for him.

When Brettner had finished, his companion asked: "What do your officials say?"

Fred tried to make light of the situation:

"They're all up in the air," he said smiling, "and if they knew of the existence of Marino there'd be a sudden war. I hear that Blaine and his ship disappeared between here and Honolulu, without a word or even an 'SOS.' The officials don't know what to make of it, and they're naturally disappointed in me for having lost my ship. I'll have a hard time sticking to my story."

"You'd better stick to it, though!" snapped the Grand Master's henchman: "It is useless to fight Marino, even if you were yellow enough to desert your girl and tell the truth. You'd never see her again—and, believe me, you yourself wouldn't live longer than twenty-four hours!"

Brettner shuddered. "I suppose you have the best of me!" he said: "Well, Skipper, if we're to be friendly enemies, let's get down to brass tacks. Are your men going to make life miserable for me by shadowing me?"

The pilot from Marino nodded.

"Well, will there be any objections to my going to my girl's apartment and getting her some of her clothes?"

"None."

Brettner thanked him: "I'll go to the office first, and arrange to leave, if they'll trust me with another plane, tomorrow morning. South to Guayaquil on the same route. I'll meet you two hours out."

"Don't bother about the time," said his companion, a rather good-natured fellow who had seemed pleased with Brettner's nickname of "Skipper": "I'll follow you out."

"But don't you think headquarters will want to see you and thank you for having saved the life of their valuable pilot-captain?" Brettner said satirically.

"Yes! I brought you here only so that our agent would know ahead of time about your arrival. Your offices are buzzing with excitement by now. Our man is one of your employees, and will be watching you when you arrive. Let's go."

They got into the plane again and, after skimming over the residential section of the city, landed at the Grand Central Terminal. As they did so, the chief dispatcher came out to meet the plane. He was, by name, Gastro—a short, fat man with a heavy shock of grey hair. His peculiar appearance had made him an outstanding character in the minds of the patrons of the International. No one who had ever seen him could forget his oily face and his great hair. And, strangely, he was smiling when he shook Fred's hand in greeting. "The loss of those three planes has certainly aroused the officials," he said: "But I'm glad you're safe."

The acute Brettner could not help noting, when he introduced his 'rescuer,' that the eyes of the two met in a manner that told that they were already friends. They exchanged ostentatiously formal greetings and talked as strangers. But, as Fred Brettner looked from one man to the other and reviewed the events of the day, he was awestruck by the possibilities inherent in Gastro's association with Marino.

CHAPTER IV
Gastro

GASTRO accompanied Brettner through the throng of planes and into the field office, leaving the pilot with his plane. Fred took a seat across from the dispatcher, who had relighted his inevitable cigar and was regarding him blandly.

"The officials are deeply concerned about so many mishaps, Captain," he began.

Fred felt that strange shudder run through his body.

"We have lost three planes today," continued the dispatcher, "and you are the only pilot who has been lucky enough to return. It is reported that a number of privately-owned planes have disappeared suddenly while on cruises. I do not know to what we may attribute these strange disappearances. But we've got to go on. The commerce of the world must not be delayed by the loss of a few ships." He chewed the ropey cigar for awhile and studied the floor: "I'm giving you another ship, Captain. I suppose I'd give you any number of ships before losing faith in you."

Brettner gasped, it was all working so smoothly. "Oh, I—" His voice fell: "Thank you, Gastro."

The dispatcher rose and walked up and down the room. He had lost his blandness and was now visibly nervous. "Good Heavens, Captain," he said finally, "we mustn't lose all our ships! We've got to have men who will exert every effort to save their commands, even at the expense of their own lives. You asked for a cargo plane this morning—were you afraid to take passengers out on your first trip?"

"No," said Brettner: "I wanted to be alone—I had some trouble." His voice fell: "My fiancée suddenly disappeared, leaving me only a line or two. I suppose that's my own affair, though!"

"Of course," said Gastro: "Of course—Of course." He said it the third time, as though the words fascinated him: "Come around tomorrow and I'll give you another cargo plane—with an important load for Buenos Aires. You must get it through. Good night!"

"Good night!" said Captain Brettner, in a mechanical voice. On the street again he was suddenly conscious of being in the hands of so powerful an Order, with agents in such unexpected places that he did not know whom to trust. His best friend might have belonged to it. "Conquerors of the World," eh? Well, they had him. Nothing short of death could now relieve him of his responsibilities to them, responsibilities which he must fulfill if he was to save Nadia from death or worse. He had the consolation, at least, that he would never have stolen a penny for his own gain. But to save the life of Nadia, what might he not do? "Conquerors of the World?" And wrecking the happiness of youth in order to fulfill a mad dream. Of course that would be their method. Entrap young men into their Order, to get them to deliver their stolen planes. Planes cost thousands of dollars. A big cargo ship such as the one Fred had landed upon the deck of Marino had cost two hundred thousand, to say nothing of its costly freight.

"Whew!" he breathed. "This Order has the system. Their planes cheaply obtained—stolen. Ready to rob government stores of explosives. Using the sun's energy to give them power. Gee, if I could only induce the government to raid Marino!"

But he knew he dared not make a false move. He was certain to be observed, and the result would be the sudden death of Nadia. No, there must be a more subtle way. Schemes ran through his mind; but none of them seemed practicable. Men were watching him; perhaps the very policemen in the streets belonged to the Order. An attempt to converse with a policeman might bring about his death. How many people were in the hands of this fanatical Grand Master? So many planes had disappeared that day as to alarm the government officials. The news bulletins carried shouting headlines of great losses all over the land, sudden disappearances for which there were no clues. While pass-

ing a newspaper office on his way to Nadia's apartment, he heard the radio announcement from the governor's office, of an additional reward of twenty thousand dollars for information leading to the discovery of the missing passenger plane. Brettner shrugged his shoulders. The world was totally unaware of what it was facing.

At Nadia's apartment, he procured her key from the landlord, who knew him well. In her living room, he stood motionless for a moment. The atmosphere brought back so many memories, and struck so much terror to his heart when he thought of what she might suffer, that he sank into a chair and covered his head with his hands. Is life like this? One tries his best to live honorably, by the law of his being, and a great, crushing force arises to smash his life to bits.

Within his mind was the consciousness of having a great battle to fight. He must not give way to weakness. He must be strong and clever. Were the battle for himself only, he might have taken a great chance, a long shot. But, with Nadia's life hanging in the balance, with their love restrained, their entire futures threatened with ruin, only the subtlest moves could save them. He knew what he meant to her and what she expected from him. He must not disappoint her. But this was not a question of pride—it was a fight for her life. The flyers who had first hopped across the ocean had only their own lives at stake and could take chances; he could take none. He *must* save Nadia and, in doing so, he would save the world.

So Captain Brettner took a small traveling bag and filled it with Nadia's belongings; after which he hurried back to his hotel. Ceaselessly his mind reviewed the possibilities of combatting the forces of Marino. No possible way of telling the governor. They would kill Nadia and himself, even though he succeeded. The slightest move toward giving away the secret might result in his death. The only means by which he could act through his employers would be discovered by Gastro who, he was sure, was a traitor in the employ of Marino. And yet he could prove nothing when called upon to do so. He decided to attempt a few hours of needed sleep, which might help to unravel the tangle of thoughts which ran through his mind.

Just before he reached the entrance of his hotel a passer-by came close to him as they approached, speaking low and quickly: "Remember, Marino watches you. Go to your room. You will be watched from the room adjoining yours." The man went on with unchanged pace, leaving Brettner on the curb staring backward at him in amazement.

Two Conspirators Meet

THE Buenos Aires freight plane was loaded and waiting the next morning when Captain Brettner walked nonchalantly into the office and saluted Gastro, with a forced smile upon his face. Gastro seemed surprised; and, when he had handed Fred his orders and the young man had gone out again whistling cheerfully, the dispatcher shook his head and whispered, "Game boy!"

A stranger who had landed his plane on the field hurried into the office. Gastro appeared not to observe him until four skylarking pilots had passed on through the gate nearby; after which he nodded to the newcomer. There was a whispered conversation between them.

"Better keep Brettner aboard after this," said Gastro: "He's the only new man you've risked sending ashore—dangerous business."

The strange pilot nodded slightly: "True, but we have his sweetheart. He's a valuable man. The Grand Master needs him for the dangerous work."

"Oh, I see. He wanted to see if Brettner could be trusted, eh?"

"That's it," said the pilot: "His hands are tied. Your tip about placing his young woman in our power was a good one. I have been told while aboard that, if he shows any hesitation hereafter, he will get what all traitors get—the extermination room."

"The what?" Gastro's face paled as he leaned toward the stranger. The latter looked at him intently:

"The extermination room. A bare room with vents in the walls to admit a gas that disintegrates whoever is inside."

"My God!" thought the dispatcher.

The pilot continued proudly: "It was I who suggested to the Grand Master that this room be put to use in the case of all prisoners we cannot use, as well as for traitors. We are holding the threat of it over the young woman, to ensure her lover carrying out the great mission."

Gastro shuddered inwardly at this man's words.

"Yes, the great mission?" he said absently.

The pilot nodded: "The thing that only the Grand Master knows. However, he is now sorry that he permitted this young man to lose a plane and thus lose favor in the eyes of the officials. It would have been better to allow him to gain more of their confidence, and then turn everything over to us. It seems that Marino's success lies in the hands of Captain Brettner." The pilot smiled again.

"The Grand Master is very astute," breathed Gastro.

The pilot's eyes narrowed: "No one dares to think him unwise!" he said.

"If I had done so, I would never have accepted your proposition," said the dispatcher: "But I want to be the ruler of one of those South American lands."

"Your wish will be gratified when we have succeeded," said the pilot.

* * *

Captain Brettner lifted his plane above the fog, south of Los Angeles, and set his course indicator for Buenos Aires. He must fly along it for a few hours to avert suspicion, before turning toward Marino. His great problem kept revolving through his mind, in the depths of which he felt there must be a solution. He would cheerfully have given his own life, if that would help. But there was Nadia; what was happening to her now? Would they ever be free to love each other again, to go their own way as free men and women do? He writhed inwardly. Then he straightened and began coolly to consider matters. He was in a most singular position. There was one possibility by which, if nothing interfered, he could save the world from Marino. The solution to his problem he saw lay in Nadia's ability, to send a message to Metter, the greatest chemist of that day, whom he knew. Metter had finally proved that he could place, in the bulk of a bomb a man could carry, an explosive powerful enough to destroy everything within a mile; the discovery had just been reported briefly in the radio news bulletin, which he had tuned in, while in his room the night before.

Two hours out—five hundred miles from Los Angeles—there drew alongside the pursuit-plane which had taken him ashore the evening before. The pilot did not even look his way, but turned towards the west; and Brettner followed.

As Brettner moved along behind the other plane, his thought returned to Metter and his tremendous invention. Then he thought of another resource which might, possibly, save the situation. The psychological experts of his day, exponents of the development of the human mind, had so nearly reached perfection in their science that the long scoffed-at feat of mental telepathy had come to be realized among them. If he could only "tune in" on one of them and tell his great secret, the receiver of it might be able to awaken the nations to their danger. He would try it, not knowing whether or not he was succeeding in the least. He would endeavor to communicate with one of them in particular—Professor Ray, whom he had met months before, on a Vladivostok-bound air-liner. The professor had then mentioned, and had demonstrated, some of the fundamental principles of mental telepathy, which Brettner had absorbed with the greatest interest. But he did not know where the professor might then be.

However, he took from his pocket a small ball, a common steel ball which had come from a bearing, and used this tiny convex mirror as a concentration point; thus making use of the principles which had set forth by the professor, he looked into the glistening object for a moment and focussed his mind upon a mental picture of Professor Ray.

The image did not appear for some five minutes, by which time the plane hit a rough spot in the air and required his undivided attention. Fred looked up to see the pursuit-plane above him. He then reverted to a crudity of several decades before and swore aloud. He was angry; his anger served him well. For, when he again looked into the ball, with fierce determination in his soul, the image of the professor stood out better than he could have expected. He believed that he now had mental access to Professor Ray. But he kept his mind off Marino. He made a mental picture of his room at the hotel, with the professor entering. He mentally told the professor to wait therein for him, three days hence, at two in the afternoon when he expected to arrive. Perhaps futile, perhaps dangerous. He was a drowning man grasping a straw. Would Ray recognize him and conceive what urgent need might lie behind this unusual request?

Presently Brettner straightened his plane again and looked about him. He was flying straight. He looked into the ball again, hoping the professor would respond. He closed his mind to everything save the supreme effort, desperately concentrating on Professor Ray's image and the message. Finally he relaxed, as he found the mental picture of the professor nodding at him. He relaxed and wiped the sweat from his forehead. He hoped that his conversation with the professor had been real; that it was not a product simply of his fervid imagination.

What Nadia Revealed

SOME time later, Fred Brettner looked out to see the pursuit-plane hovering near, nosing down for a landing. He saw the little plane slip several thousand feet, circle and then slide down to the ocean surface. It must be Marino. It was! He saw the plane taxi up to the elevator and disappear. He circled the great deck, put the great freighter "on her ear," and slipped for a landing. He came in slowly, with the old "Lindbergh skill," as Blaine had called it. He had often thought how skillful the Lone Eagle must have been, to fly such a contraption as *The Spirit of St. Louis* across the Atlantic with a low-powered motor of his times. Blaine had commented that Brettner could have done it before breakfast with a modern plane.

The guards met him as he descended to the deck. Not a word was spoken. He was ushered below into a room where there was a table, with food and plates for two, and was instructed to wait for five minutes. At the end of that time Nadia came through a door opposite. They embraced. It all seemed too good to be true. This was a trap, he was certain, and he wondered how he could tell her. As he gazed at her, her eyes showed a glint of understanding. They talked of trivial things and avoided the topic which most concerned them. There must be eavesdroppers about. He could see that she wanted to scream in the tension she was under, but she was bearing up like a good soldier. Nothing weak or petty in Nadia!

"I brought your things," he said: "Left them in the plane. If they permit you to have them, I am sure they will be delivered safely to you."

"Was there a letter for me?" she asked, munching a sandwich.

"No, darling, nor does the landlord seem worried about your sudden disappearance. I suppose he knows all about it. Marino is all-powerful. I must do all I can to serve her."

He saw a sudden look of pain come into her eyes. So she didn't understand. Her look showed that she now believed that he had deliberately trapped her, that he himself was a member of the Order. She didn't know he was lying for her sake. But there were probably cunningly-concealed microphones in the room and, perhaps, telephoto instruments which showed every facial expression. His own countenance, he felt painfully sure, seemed unconcerned. She saw it, perhaps, as a deceitful face covering the subtle actions of the man whom she had loved. He dared not tell her that he was not a member, not even a sympathizer of the Order. Yet he could not continue the meal in painful silence. He had to talk.

"Marino has great possibilities," he went on recklessly: "It is governed by the greatest mind the world has ever known. I now believe he should be the dictator of it all. He is a conqueror, but he does not wish to destroy. He wants only to rule wisely. I am his servant. Perhaps, after all he has accomplished his purpose—and I am going to exert every effort in his behalf—he will be kind enough to give me a place of trust and importance. Who knows?" He breathed a sigh and avoided her look.

A door opened; a guard entered, stood silently for a moment, and then motioned for Brettner to follow. Then terror filled Fred's soul. Nadia had risen from her chair, screaming:

"Take me out there—out there to that horrible room—For God's sake take me out and let me die! He—he is the greatest traitor in the world—a traitor to his country and to me!"

"It is best that you know," Fred lied again: "I can do more for you as one of Marino's subjects and make you far happier than otherwise. You *must* understand," he pleaded: "Have faith in me and in Marino."

"No!" she shrieked: "I'll die first! You didn't tell me—you took my life in your hands, so that you could have me with you in your association with these pirates! I hate you with all the bitterness of one who has loved you and discovered what a criminal you are. You used my love to steal my freedom! Love! I would rather die than marry you."

His eyes followed her as she tottered to a seat. A great pity filled him, but he knew he must go on. She was looking at him again, and he forced himself to face her.

"I wish they would let me walk into that room and die," she said.

"What room?" he asked, suddenly ignoring the guard's tug at his arm.

Nadia uttered harshly: "Into that room where the guards drove a hundred prisoners of your Order of the Conquerors of the World! Into that room of absolute destruction, from which no one may return!"

"My God, no!" he said, terrified.

"Your best friend, Joe Blaine went in there last night!" she said. And then she sighed and slumped, faintingly, to the floor.

The guard insistently pushed him through the door and into the aisle. He was blinded in the flood of his bewildering thoughts. His uncertain footsteps faltered. He had stood up under so much that the addition of this terrible news found him unequal to the situation. He, too, fainted, and merciful unconsciousness brought peace to his soul.

CHAPTER V

Some Regrets

THE Grand Master of the Conquerors of the World had dismissed his advisers and retired into solitude in his magnificent headquarters. He was, for some reason, in lower spirits than usual. Perhaps he regretted that the laws which he had laid down for Marino had exacted the lives of so many prisoners. Perhaps he felt himself in the power of an organization which he had started and which he ruled, and yet one which he himself could not deter from its course. He may have been reviewing swiftly his youthful idealistic dream of the conquest he was now engaged in. He had killed many in the initial work of building this great submarine and equipping it. Yet he had never wished to kill anyone—even for power. And, although he perhaps had the world already in the palm of his hand, he now felt that he had made a mistake, had gone against his own conscience, in decreeing the death of his prisoners. And in this hour he was nervously upset. In his agony and regret, he thought of ending his own life. But he restored his firmness in the belief that, once having accomplished his purpose of dominating the world, he might again forget—live down the terrible memory of the evening before when Captain Joseph Blaine had marched before a hundred other pilots and mechanics into that room of extermination, and to an unexpected death. He was still trying to clear his mind of the last compunctions when the door of his office opened, and his first aide came in.

"An important message for Your Excellency," he said.

"Proceed," snapped the Grand Master.

"Captain Brettner, whom you ordered to report on his arrival, has collapsed upon hearing of the death of his comrades, Sire."

The Grand Master's face paled:

"Who permitted him to know of this? A most damnably demoralizing thing to tell so valuable a man!"

"Miss Deneen, Your Excellency—at luncheon. He acquainted her with his desire to become a servant of Marino; upon which she told him of the disintegration room and what happened there last night."

The Grand Master did not lose control of himself, as a lesser leader might have done. He had indulged in useless regrets, perhaps, but they must not deter his action. What had happened was now irreparable.

"How many planes have we aboard?" demanded the Grand Master.

"Three hundred and ninety-eight, Sire."

The Grand Master breathed deeply: "Radio to Gastro ashore; he will meet our pilot in Captain Brettner's room in the hotel in Los Angeles. Be sure to send a resourceful man for him. Also, have five hundred of our pilots ready for action upon an hour's notice; have their planes here and ashore equipped for destruction. Have the Grand Marshal remind them that, if there exists a traitor among them, he will die immediately upon being discovered. Deliver these orders yourself. Now have a guard bring Captain Brettner here." The Grand Master's voice fell abruptly. He wished he could simplify matters; but, as they stood, the world must be conquered before it could learn of the power which was being massed against it.

Captain Brettner was brought in and placed on a *chaise longue* before the Grand Master, for he was still too weak to sit up. His audience with the Grand Master came as a relief; but he was determined to keep his lips closed and learn all that was possible. The Grand Master smiled reassuringly upon him:

"You have done good work, Captain. You have placed two valuable cargo ships in our hands without being suspected. Their cargoes alone are of great utility to Marino. The planes I will use in the work of reducing several important cities along the North and South Pacific coasts. How do you feel about all this; especially if I offer you, when we have triumphed, the governorship of Argentina?"

Fred was thoughtful for a moment:

"A most unusual offer—a governorship. Yes, if I can be of such service as to merit such an office, your slightest wish is a command. My only request is that you relieve Miss Deneen of the mental suffering which came of her belief that I had purposely allied myself with you and was aware of the plans for her abduction before it came about. Tell her what you may, otherwise. However, I prefer that you should release her and retain me to help you."

"She would tell the world of our plans," objected the Grand Master: "No! With her, matters shall stand as they are until you have carried out the great mission which I have planned for you. If I permitted her release, I might not trust you fully to carry out this mission. Upon your completion of the great task for which I have chosen you, I give you my word of honor, you and the young lady shall be free citizens of Marino; but not until then."

"What do you wish of me—what is this great task of which you speak?" asked Brettner, weakly.

The Grand Master resumed his seat. His eyes sparkled and his forceful voice was impressive: "I gather from an informant ashore that you are acquainted with the great scientist, Metter," he said.

"Slightly," agreed Fred: "He was a passenger on my plane, on several trips."

New Orders

THE Grand Master was apparently pleased with himself. "Professor Ray was right," he said, smiling.

"Professor Ray!" gasped Fred.

The Grand Master nodded: "One of my worthy allies. A great scientist of the mind. He claims to have

tuned in on you today as you flew this way. May I ask why you wanted him to meet you, in your room at the hotel?"

Brettner could only tell the truth, astonished as he was. He knew that, if this mental science had been so developed as to reveal what was upon his mind at a given hour, they were likely to know the rest of his message.

"I wanted to have him help me obtain the release of Miss Deneen," he admitted.

"You are an honest man," said the Grand Master with cynicism. He leaned backward in his chair and looked toward the ceiling, then straightened with determination: "Go ashore with your pilot—No. 313, this time. Return to your room in the hotel. The pilot will there meet Gastro, whom you perhaps have already suspected as my agent. You are not to return until after you have obtained from Metter a few pounds of those explosive tablets. You are to telephone, as soon as instructions to do so are given you, and make an appointment to meet him. You will tell him you require this explosive to bombard a shoal out in the Pacific, and thus create an island where you can have a little place of your own. It sounds like a weird story; but it has been done. I am confident that he will let you have the explosive. It is the only one which will serve the purpose of the great mission; the particulars of which you are to know when you have returned and reported to me. I am going to give you five thousand pieces of International gold with which to pay Metter. You may depart within an hour. Remember, if anything transpires which shows you to be a traitor to us—and to your sweetheart—it will mean death to both of you."

Brettner rose quickly from his lounge, feeling much stronger. Apparently not in the least concerned by the last words of the Grand Master, he was inwardly troubled, however; for with Profesaor Ray following his mental trail he dared not make a tangible plan. It seemed that his fate was sealed. But he then remembered how the professor had told him of the art of placing his mind out of focus, so that none save himself could know his thoughts. And, if he could accomplish that, then Professor Ray who had chosen to join the "Conquerors of the World" might prove his own undoing.

"This Grand Master is a resourceful character," he thought, while he was being helped outside, and into the room where a white-shirted physician was to examine him and fit him for "the great mission."

Knowing that not only the fate of Nadia and himself depended on his ability to conquer Marino, Captain Brettner was at a loss to steady himself for the great ordeal which he must soon face. However, in the depths of his mind, there lay a message that vaguely conveyed some hope. The thing was not definite, but his intuitions were strong; as were the intuitions of all educated and refined people of his day. And he knew this plan that was still incubating beneath his consciousness would come to success, in some manner.

That evening found Fred Brettner again in his hotel room, where he waited, more or less anxiously, for the return of pilot No. 313. The latter had brought him to the airport near Los Angeles, and escorted him all the way to his room; then left with the assurance that he would return as soon as Gastro had taken possession of the room next to his own.

When Fred opened the door for a peep down the aisle, and saw Gastro enter the room next to his own, a sudden inspiration seized him. He remembered the orders which had been given him—to converse with no one. He imagined this applied to such individuals as Gastro, as well as to those not associated with the Order. So he suppressed his desire to spring at the traitor's throat, and stepped quickly back into his own room.

He did not close the door tightly, though, but stood there waiting for the appearance of the pilot who was to return and give him the word to telephone Metter. He had a conviction that the pilot would first talk with Gastro—and so overhearing any conversation between them would be of benefit. So he was waiting close to the door, when he heard footsteps come past to Gastro's room, and a soft knock. Fred heard Gastro open the door, and heard it close again. He opened his own door softly to see if the pilot had entered Gastro's room. Concluding that he had, Fred stepped softly to the door of the other room and bent down to listen. He heard the pilot ask Gastro to get something from the dresser. The latter turned around apparently to obey and in that moment, through the keyhole, Fred saw the pilot whip something from his pocket. It was a strangely-shaped weapon—"the Radium-Ray pistol which kills instantly without loss of blood," Brettner thought horrified. Before he could open the door and spring upon the assassin the latter had turned the weapon upon Gastro. There was a silent, bluish flash and the dispatcher wilted to the floor and lay still. Then reason left Brettner. At the sight of this atrocious act he forgot the danger that menaced himself, Nadia and the world. He swung open the door, threw himself upon the back of the murderer, and gave his arm a sudden wrench which sent the gun spinning into the corner. The big pilot turned upon him and showered a rain of blows with his free hand squarely on Fred's face. But the latter, in his fury, drove his own fist into the body and face of the pilot as fast and hard as he could strike.

Round and round they struggled. Once, in the turmoil of it all, Fred felt himself weakening. But a picture of Nadia came to him, with all the radiance of her smile and, again, all the bitterness in her look the last time he had seen her. These "Conquerors of the World," were ruthless pirates. His own pal, Joe Blaine, innocent of all intrigue, had been murdered by them. He must overcome this man. Yet the pilot was crowding him, and working him around, in order to get at the pistol which lay near Gastro's body. Brettner realized the fact and himself struggled for the position which the pilot had tried to gain. And, when once he had forced his opponent's back against the wall, the grim determination of the unbeatable fighter filled him. He continued to exchange blows now with a renewed fierceness. An unconquerable soul dominated him. Yet an unexpected blow unbalanced him, and he found himself on his hands and knees on the floor, the pilot leaped to get the pistol. A prayer ran through Fred's mind; he himself was willing to die, but now in his hands might lie the fate of the world. He hurled himself in a flying leap toward the knees of his antagonist; it was the perfect tackle, not forgotten since his college days, and the big man crashed to the floor. His head struck the side of the bed and he lay still, an ugly wound in his temple. The blow had been fatal. Fred bent down, felt of his heart; it was still.

There was no time to lose; he hurriedly closed the door, locked it, and returned to his own room. Quickly, he washed the blood from his hands and face, hurriedly changed his suit and was ready for further action. He opened the door and then looked down the hallway;

it seemed, fortunately, that no one had heard the fight. So he again opened the door of Gastro's room and entered. The killing of the dispatcher puzzled him and he wished to discover its meaning. Searching the man's clothes he came upon a curious little badge; it was that of the United States Secret Service! So that was it! Gastro, in the employ of the government, had been outwitted, decoyed to this room, and put out of the way.

But he could not waste time over that. He had a mission—to telephone for Metter. In the telephotophone he saw the face of a Japanese servant, and asked for the scientist:

"He is out of the country, Sir," spoke the servant. "I do not expect him back here for a week."

"Are any of his colleagues here?" asked Fred, suddenly frightened. He was thinking of what would happen to Nadia if he could not promptly return with the pills of explosive to the Grand Master.

"They have accompanied him," answered the servant: "Can I help you?"

"Yes," said Fred: "I am going to ask you to do something for me."

The face of the Japanese was expectant and pleasant. Whereupon Brettner outlined his needs. The face of the servant was wreathed in a smile. He hesitated a moment. Brettner smiled and added: "And there's five thousand pieces of International gold for you if you arrive here within thirty minutes."

The servant agreed instantly.

While waiting for the man's arrival Fred examined the weapon, making certain that he could operate it. Then he put it into the carton in which he had carried the gold, placing the money on the bed. When the Japanese arrived, Fred greeted him with enthusiasm and an apparently light heart, exchanged the money for the package of tiny white pills which had cost many lives, and might cost so many more, and bade the man adieu with a feeling of relief.

No words of explanation had been necessary. Only there had been in the eyes of the Jap a strange light of humor—a thing for which Fred could not account until he looked into the mirror and saw how his face was swollen. Perhaps he could offer an excuse to the Grand Master, he thought. So he switched off the lights and hurried from the hotel. He wondered where to go next, what to do. Perhaps he could find the course by compass. But, if he could get a plane through the Order, the automatic course-indicator would take him there. Reentering Gastro's room, he walked over to the pilot's body and ripped from the inside of the man's blouse a green and white ribbon; that was evidently the sign of the Order. So he drove out hastily to the tiny field, where the ships of the Order had always landed, and on displaying the ribbon was give a choice of planes. The one in which he had arrived was waiting there, headed into the wind, so Brettner chose that. Ten seconds later, he was off to Marino.

Four hours later, while dawn was rising in the East, he saw the indicator settle to zero, and knew he was again over the floating nation. He nosed down and searched the ocean about him until finally he discovered the deck of the great submarine. Then he leveled off, circling a mile away, while he contemplated his next move.

Suddenly he thought again of Professor Ray. He wondered if the mental expert had discovered what had happened. By means of what he had learned, he believed that he had closed his mind to the professor. But what if he had failed?

The brightening sky had surely revealed his plane to those below. He dared not wait longer. He nosed down and let out the pontoons until the little plane settled quietly in the water near the edge of the submarine. Her pontoons held her there until Fred cleared her and found himself on deck. He looked about him, but discovered no one. Guards always waited at the landing places on deck; it would seem that an amphibian never landed in the water.

Apparently, too, the Grand Master was ready to move the great structure upon a minute's notice. And suddenly this seemed to happen, in an unexpected way. A great stream of men suddenly emerged through a hatchway, perhaps a quarter of a mile away, and stood waiting. Then the elevators brought up plane after plane, and into each of these climbed two men. The planes took their positions in line at the further end of the deck. The silence of the motors was weird, and the whirr of the propellers was fantastic to Fred. He was frozen in his tracks for a moment, until he recalled all the ordeal through which he had passed. And then he slid down a hatch and hurried toward the room of the Grand Master. When he arrived, and convinced the orderly at the door that the packages contained what the Grand Master had been waiting for, he was ushered into the antechamber; where he had to wait for only a short time. He listened to the voices in the Grand Master's office. When the orderly announced him, he heard the Grand Master say, "Yes, yes—Bring him in." Fred laughed silently. A flash of intuition revealed to him, that the Grand Master was in immediate need of sympathy and assurance; that the agony of a troubled conscience for having sent a hundred or more of the world's finest citizens to a terrible death, was eating at the vitals of the super-criminal.

Captain Brettner steeled himself. It was the first time in his life when he felt the desirability of a stimulant; for he was, by nature, almost totally incapable of deception. But his plans were made and he must follow them. He was surprised at his own resolution when the orderly escorted him again into the presence of the Grand Master. A coolness born of desperation had come over him and he faced the great pirate with his boyish smile.

The Grand Master was grave. "I am glad you have reported on time," he said: "You have been in a struggle?" he added as he surveyed Fred's features.

Fred saluted: "To execute your orders, Your Excellency, I was forced to defend the explosives which you ordered. Gastro had turned traitor and killed pilot 313, and in turn I killed Gastro with the pilot's Radium-Ray gun. On Gastro's body I found the badge of the United States Secret Service. The bodies are awaiting discovery at the hotel. Of course I cannot return for I will be accused of their murder. I trust I am safe in your protection."

The Grand Master studied Fred's face a moment, and then directed a series of searching questions at our hero. Whereupon Fred related an ingenious tale of his suspecting Gastro, and the latter's attempt to gain possession of the explosives; the ensuing struggle and the killings. "I had your orders to bring them here, and here they are." He placed the dangerous packages on the desk and stood at attention.

The Grand Master smiled again, reassuringly: "You have proved yourself," he said. He pressed a button, and his orderly entered the room. Then he turned back to Brettner.

(*Continued on page* 557)

Flannelcake's Invention...

by H. McKay

(Illustration by Winter)

The austere Mr. Maxwell rushed to save the machine and Mr. Treat rushed to save his cat and both arrived just as the cat let go and landed in a mad scramble on the faces and heads of these two gentlemen.

FLANNELCAKE'S INVENTION

HORACE TREAT, of Treat, Trout and Treat Corporation, Fiscal Agents, looked up as his secretary entered the private office.

"That crack-pot inventor is out here again, and he says that he is not going away until he sees you," she announced, indifferently.

"Well, dammit, send him in and let's get the torture over with."

The girl started out, but was almost knocked over at the door by that "crackpot inventor" as he dashed in.

"Glad to see you, Mr. Treat, I'm Joe Flannelcake of the Sunset Aviation Club. You remember me; I was one of the fellows that helped launch that glider the day you dedicated our field. I've come to you to demonstrate the greatest plane the aviation industry has ever known; a revolutionary idea in heavier-than-air craft. As you know, it has long been the idea of aviators to produce a machine that would rise vertically from the ground, without a running take-off. My friend, I have just such a machine; a machine that fills a long-felt need; present planes will become obsolete over night; everyone will be riding in a 'Flannelcake Flyer'; you can't go wrong, it's——"

H. McKAY

"Hey, wait a minute! Take a breath, will you?" said Mr. Treat: "Listen, young fellow, I don't intend to listen to you practice side-show barking over some fool notion of yours. Now, what do you want; make it short!"

The self-styled inventor did not seem bothered at the rebuke; he only smiled blandly, and continued:

"Mr. Treat, you are in business for money; I have a stunt here that will make you plenty, if you want to finance it. I have a machine that will rise vertically; that alone ought to interest you."

"If it were true, it would interest me, but if you're another helicopter nut, I can't be bothered. By the way, did you make this machine yet?"

"No, I haven't; but that's where you come in, if you will——"

"Get out of here! I haven't time to listen to fairy tales!"

"But Mr. Treat, I haven't explained yet—"

A button on the desk was pressed, and a well-dressed but mean-looking man walked in.

Said Mr. Treat, "You're not going to, either! Oscar, give this guy the works."

Oscar responded by lightly tossing Joe Flannelcake into the hallway.

Horace Treat was primarily a hard-boiled financier; but he had done much to further the cause of aviation by starting glider clubs in different districts, and by his interests in aviation societies. His position had made him the target for a number of get-rich-quick inventors who hoped for his financial backing. But, after this last inventor had gone he felt that in spite of the fellow's book-agent tactics he seemed sincere.

* * * * *

Two months later, a man bearing a model airplane sought admittance at the palatial Treat home in Sea Cliff Terrace. The butler announced to Mr. Treat the arrival of a Mr. Flannelcake.

"Throw him out! I've seen enough of that flat-head," growled Horace Treat.

As the butler left the library, one of the full-length windows opened, and the ever-smiling face of Joe Flannelcake appeared.

"You ain't seen nothing yet, Mr. Treat," said he: "I've got my plane here, and it works."

Horace Treat's anger was mixed with curiosity; so he said nothing as the inventor entered the room and placed his model plane on the floor. It resembled the conventional form of toy plane, except that the rear air-foils or elevators were of the same size as the front wings. In fact, there was no telling which was the front; for each end had a propeller mounted on it. It seemed as though constructed from two toy airships, hooked tail to tail.

Horace Treat looked at it closely:

"Which way does it go, anyway?"

"Up," returned Joe, smiling blandly as ever: "Yes sir, it goes up."

"Well, let's see it go, then," snorted the financier.

First Success

JOE started to wind up the model: "You see, Mr. Treat, this plane is powered by a steel spring, of the type found in German-made mechanical toys; it is light and efficient. A propeller is connected to each end of the spring; which causes both propellers to turn, but in opposite directions. You will notice a small gear on this 'prop;' this is the rear end of the plane. This gear has a stop fastened to the teeth at one point, which automatically stops the rear propeller after it has turned a certain number of times. Now the idea of the thing is, that when both screws turn, the plane will not move along the ground, because they pull against each other. The angle of the wings is adjustable and, in starting, the front and rear wings are tilted oppositely. The wind from the propellers strikes the wing surface, and is deflected downwards, caus-

GOOD, humorous science stories are a rarity, and we feel that the present one will give you more than one hearty laugh. Incidentally, there is nothing contained in the science of this story that will not be evolved in time.

Inventors are becoming thicker than proverbial flies, and not a day goes by without some of our wealthy (or near wealthy) men being pestered to death by budding inventors with new-fangled inventions. Frequently, too, although the inventions may be crude at the time they are brought out, and may seem ridiculous to us, they eventually become necessities of life.

It is not so many years ago that men like Lilienthal and the Wright Brothers were laughed at, and Alexander Graham Bell, who invented the telephone, was shown the door as a "crank." At any rate, the present effort of our new author gives us an excellent and laugh-provoking picture of a type of present-day inventor.

ing the plane to rise upward, by virtue of Newton's second law of motion; or, now, lemme see, maybe it was the third law——"

Mr. Treat was at last interested, or at least, curious; but he was also impatient.

"To hell with Newton; let's see the thing go!"

"Yes, certainly, of course; now watch, it's wound up, and as soon as I set the gear stop——"

"Somebody sure wound you up, too. If those propellers develop as much wind as you do, the thing ought to go to the moon."

"All right, here goes now; the rudder is set, so that it will circle the room after it's aloft."

Joe Flannelcake released a trigger on the device and stepped back. The propeller spun, and the craft rocked slightly to and fro on the rug. One end lifted slightly, it rocked a bit more, and then the whole machine slowly lifted, in a wobbly fashion, to a height of about three feet from the floor. At this point the gear stop took effect, the rear prop ceased turning, and the machine started to circle the room in a curiously lame fashion. The rear end hung slightly downward, and the whole machine wobbled back and forth.

"You see," commenced Joe, "I will have to put a model of the Jenkins' reversible propeller on the rear end, which will reverse after the machine has lifted; this will push, and keep the rear end level. I shall also arrange to have the wings level out automatically, after rising so that it will fly faster."

The craft remained in the air about a minute and a half, and then gradually settled downward as the spring wound down. About a foot from the floor, the machine suddenly went into a side-slip, and landed in a corner on top of Mr. Treat's Maltese tomcat. The cat made several passes at it before Joe rescued the plane. But the cat growled ominously; it apparently thought the score hadn't been settled yet.

Mr. Treat arose with a broad smile and extended his hand.

"Well, my boy, it isn't much, but it seems to work. I'll tell you; get the thing fixed up, and be around here next Saturday afternoon. I'll have Mr. Maxwell, of the Peninsular Air Transport Company, here to give his O.K. on it. If he likes it, we can have a real one made."

"Thank you, Mr. Treat, thank you; you have made a great decision, you will be hailed as the greatest man aviation has ever known; the royalties from this apparatus will make us as rich as Croesus, it'll——"

"Can the chatter and get out! And don't forget to be back here Saturday."

"Yes sir, I already have a larger model in the making, and I'll have it finished up by Saturday."

An Accident

AT Saturday noon a group of men was assembled at the Treat home for the try-out. Mr. Treat, Mr. Maxwell, several reporters and a photographer were there to see the "latest" in aircraft. Mr. Joseph Flannelcake proudly displayed a model plane, powered by two miniature gasoline engines manufactured from cartridge shells. It was about four feet in length, and of about the same wing spread.

"Well, Mr. Treat, where shall we try it out? said Joe.

"We'd better try it outside; it's too big for the house."

"Not at all, Mr. Treat. The machine can be controlled perfectly, and besides, the wind is too strong to-day."

"Hmmm! Well, let's take it into the reception room then; but if it breaks anything, I'll break your neck."

The reception room of the Treat mansion was of ballroom dimensions; it was high-ceilinged, and adorned with pictures, vases, and bric-a-brac of artistic or antique design.

Joe placed his machine on the floor, and made adjustments on the rudder and on the gears.

"We have here, gentlemen," he began, "a true model of what the ideal plane should be. It is equipped with reversing propellers, adjustable wings, and automatic stabilizers. Now, gentlemen, this machine is foolproof; it is so constructed, that it is impossible to 'crack up' in it. It cannot go into a tail-spin, because it has no tail; it cannot nose-dive, because of the adjustable wings; it can side-slip, but its perfect balance will cause it to right itself. It has no landing wheels, because it can travel straight up or down, and needs none. It can stop, start, and go backwards while in the air. You wouldn't have an automobile that had no reverse in it, would you? Then why have an airplane——"

"Will you please stop that salesmanship, and start that thing going?" broke in Mr. Treat.

Joe started each of the tiny motors by winding a string around a projecting shaft, and pulling on it. They sputtered a bit, but soon commenced to idle beautifully, emitting a noise like an outboard motor in the distance.

"Fine little motors, these," he said. "Made 'em out of 'forty-five' shells; a piece of string from the gas tank to the manifold serves as a carburetor, capillary attraction, just like a lamp wick. Yes sir, this little boat will go straight up; just an application of mechanics, you know. Same thing as if you take an automobile, and go up a hill that is fifty feet high. The car will do it nicely; but if you should attempt to climb a pole of the same height, you couldn't do it. Not because the car hasn't the power, but because it is not harnessed right. Now, if you would put a drum of small diameter on the rear axle, and wrap a cable around it, and tie the cable to the top of the pole, the car could be made to pull its own weight off the ground. Similarly, with the plane, the motor will ultimately get you to a certain height; then, why not straight up?"

The audience was becoming impatient; that is, except for a newspaper man, who was inspecting one of the motors, oblivious of Joe's speech. Said Mr. Maxwell: "Never mind about all that. Start the thing off."

Joe moved a small lever on the back of the machine, which caused the motors to speed up to a more or less uneven roar. He then removed his hand from the top of it and stepped back. The machine floundered about for a bit, like a moth that has been burnt in a candle flame, and then lifted slightly from the floor. It slipped back and forth like a piece of cardboard in a high wind; and then rose vertically into the air. A cloud of pale blue smoke eddied up with it, making it resemble a pinwheel. The exhaust pipes threw a pretty little flame, and the thing was under way.

"Watch, my friends, the propeller is about to reverse," cried Joe above the noise.

And, sure enough, the rear blades whined a moment, and changed their pitch. The rear wings also adjusted themselves to the angle of the front ones, instead of opposite, and the machine started at a good rate around the room. It circled once perfectly, and the room was beginning to smoke up quite a bit, when Mrs. Treat entered the room, and, with a statement about smoking up her valuable tapestries, ordered the butler to open a window.

The window was opened; and when the plane made its next revolution, it was forced downward by the draft. It had been circling just over everybody's heads; but now it came down, and just skudded over a gorgeous chesterfield on the far side of the room. Up to this time no one had noticed that the Maltese was reclining on the said chesterfield; but as the plane passed over it, the cat made a springing leap for it, and sunk the claws of both forefeet into the fuselage. The craft had considerable momentum; it yanked the cat into the air, and then banked sharply upward from the added weight on the rear, like a big bird fighting a wildcat. The austere Mr. Maxwell rushed to save the machine, and Mr. Treat rushed to save his cat; and both arrived just as the cat let go and landed in a mad scramble on the faces and heads of those two gentlemen! The infuriated cat clawed deep furrows in Mr. Maxwell's bald pate with its front paws, while its hind legs were gaining good traction in Mr. Treat's mouth and nostrils.

The Juggernaut

THE plane, released from its unwelcome passenger, continued upward at its same sharp angle. The first thing encountered in its line of travel was the expensive, glass-prism bedecked chandelier, which it struck vigorously. The rear propeller sustained the weight of the machine, while the front one merrily shot glass pendants all around the room. Soon the machine cut its way through and the remainder of the fixture crashed down to the floor. Above the groans of Treat and Maxwell, who were bleeding from many scratches, the voice of Joe, happy as usual, could be heard. He was talking to the photographer, who was setting his camera and enjoying the scene immensely.

"That proves the durability of my ship. It is practically wreck-proof. The machine is perfect."

But the machine wasn't as perfect as it might have been. Its control wires were severed, for it now pursued an erratic course around the room, scraping walls and dousing everything with the oil and gasoline that were exuding through several gashes in its body. The butler dashed out of the room, and Mrs. Treat ran to the rescue of her bleeding husband. She was stopped half way, however, by the flying machine, which struck her squarely on the back of the head; and the front prop proceeded to tear out her hair. She fought it off madly, and succeeded in throwing the machine backward into the air. It veered around, boomerang fashion, and then it shot over the photographer's head, smearing his face with oil. He reeled over backwards, and went down with the reporters like pins in a bowling alley; accidentally discharging his flashlight gun. With a smart explosion and cloud of smoke, this efficiently set fire to the gasoline that the plane had sprayed around. The room was in a turmoil when the butler returned with a shotgun and aimed at the plane, which now had one propeller in the goldfish aquarium, tossing water and fish about the place. The aquarium broke open, and the plane again took the air, just as the butler let both barrels go. He missed the ship, but took most of the tapestries and plaster from one side of the room. Joe Flannelcake, trying to catch his brainchild, was desperately running around the room, stepping and falling over everybody. How long pandemonium would have reigned is not known, if it were not for a lucky circumstance in the flight of the ship. For no reason at all, the plane suddenly started to fly straight—yes, straight for the large bay window at the end of the room. As a fitting climax to its reign of terror, it crashed loudly through the glass. Joe followed it to the window, and gazed wistfully after it as the strong breeze through the Golden Gate carried the plane into the waters of the bay. He watched the spot where it had disappeared, totally unmindful of the room behind him, which was now burning furiously. He was awakened from his coma by the arrival of the fire department; and, when he went through the window to the street, he was met by an angry group of blood-spattered men. They might have been recognized by their closest friends as Mr. Treat, Mr. Maxwell, and some gentlemen of the press.

"Well, gentlemen, it's too bad that things turned out this way; but really, it shows what a good machine——" he started to say.

"Good machine, h——l," said the battered Mr. Treat: "You dumkopf, nincompoop, flatheaded, crackpot!"

And, as one man, they all started after Joe.

But Joe had been a track runner once, and he was soon out of sight.

Spoke Mr. Maxwell, sorrowfully, as he staunched a new stream of blood from his cheek: "Even at that, I'd like to see a full-size Flannelcake flyer."

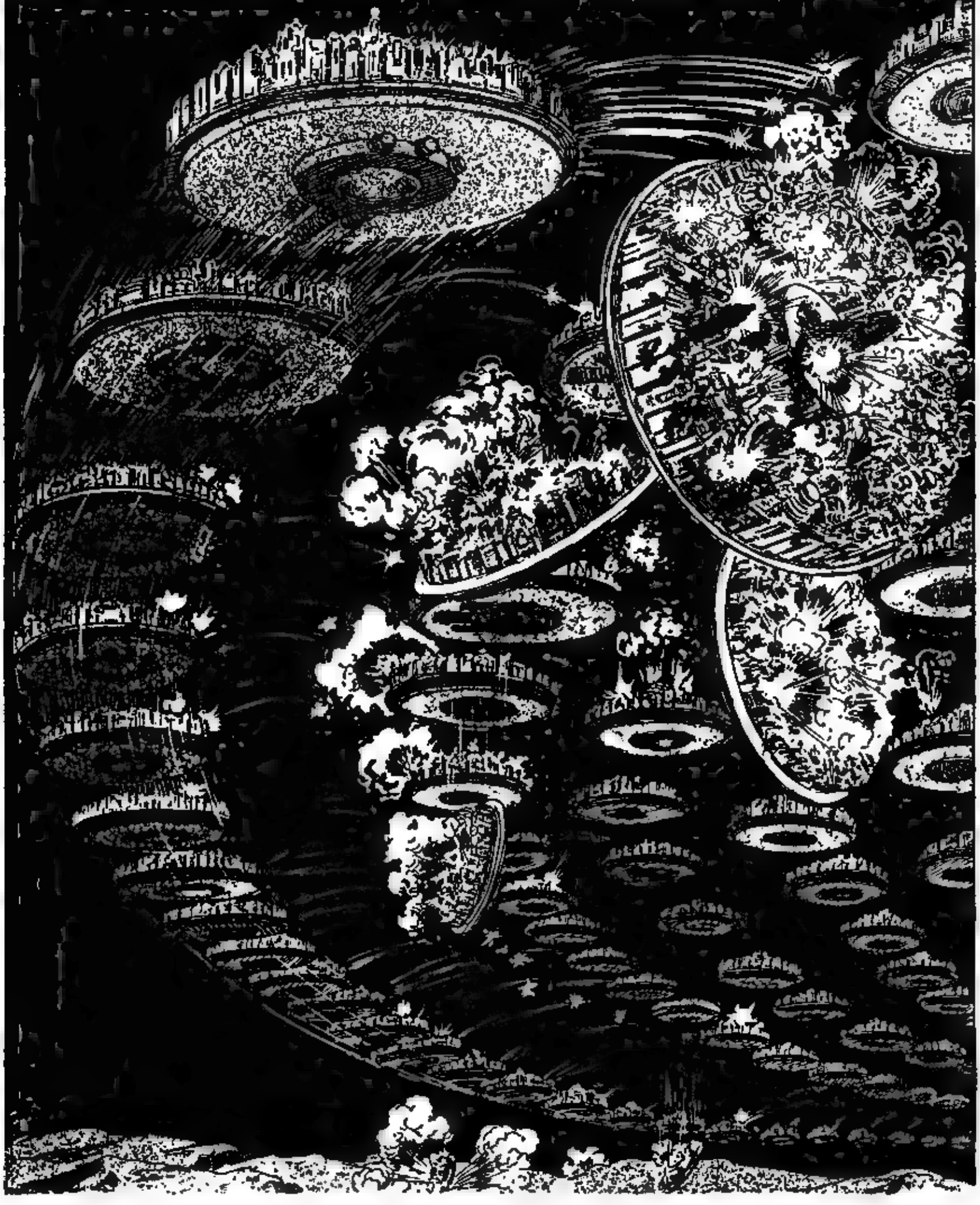
THE END.

TO LEARN HOW YOU CAN NOW ACQUIRE
A LIBRARY OF THE CLASSICS
OF SCIENCE FICTION

Turn to Page 484

CITIES IN THE AIR

by Edmond HAMILTON



(Illustration by Paul)

Now our line turned like a wheeling snake, high in the air and was rushing back upon the circle of our enemies. And as our long line of mighty cities whirled past them all our batteries were thundering.

CITIES IN THE AIR

By the Author of "The Hidden World"

What Has Gone Before

War has been declared between the American Federation of cities in the air and the combined European and Asiatic Federations.

It is at a time when all the cities of the earth are suspended in the air on great metal structures like discs, the cities being movable horizontally as well as vertically.

Captain Martin Brant, commander of one of the air squadrons, is called back to New York to join his fleet. They have learned that from Europe and Asia are coming two waves of attack on America.

Captain Brant's squadron, with a great number of other cruisers, is ordered out over the Atlantic to repel the European invasion; while an equal number of American cruisers are ordered out over the Pacific to repel the Asiatic invasion.

The Americans meeting the European cruisers over the Atlantic are outnumbered, although both sides lose a great number of ships in the bombardment of heat shells. The Americans by a ruse ambush the invaders, who finally retreat defeated. The next day Captain Brant is sent with a fleet of cruisers on a raiding expedition to Berlin, the capital of the European Federation. After many adventures, the Americans break through to Berlin and make a raid on the city, but Brant and his two junior officers, Macklin and Hilliard, are captured. In their cell they meet Connell, another American officer who had been detected by the Europeans as a spy. He tells Brant that the Europeans are making some improvements in their air cities, and intend to move the cities of their coalition against the Americans and finally destroy them. Now, go on:

I STRODE to the square little window, looked forth from it. It was quite open and unbarred, and large enough too to allow one to pass through it, yet as I projected my head from it and gazed up and downward in the darkness I saw that there was no need of bars across it. For the little window was set directly in the sheer, towering side of the mighty power-tower's pinnacle. Far up above our level soared that tremendous tapering tower, so far that the tip seemed among the stars above, while far below, a thousand feet at least, lay the smooth metal of the great plaza. And though there were other windows below and above us, each was separated a full ten feet or more from the other, and, as we knew, to merely escape from our cell into another level of the great tower would avail us nothing, since to gain the plaza outside we would need to pass through the tower's lower levels thronged always with armed guards. It seemed, indeed, that as Connell had said there was no hope of escape for us, the door being solid, thick metal, and as I turned back toward the other three something of Connell's own hopelessness had taken root within my heart.

EDMOND HAMILTON

And that hopelessness grew within me in the hours that followed. For when day came and illumined with brilliant light all the giant air-city that stretched far around us it seemed only to emphasize the utter helplessness of our position. Far beneath on the great plaza lay many cruisers, and could we win to one of them we might well make a break at top speed across the Atlantic, since so simple in design and so unvarying in their exhaustless power-supply are modern air-cruisers that one man alone at their bridge-room controls could operate them. Yet to win down to those cruisers, down to the great plaza's surface—that seemed impossible. And so as that day waned, and night swept over the great floating mass of the towers of Berlin, to be followed by day again, my despair was waxing ever stronger, deeper.

For during those days we could see plainly from our window the great preparations going on still in the air-city about us. Already throngs of workers had cleared away the twisted and fused wreckage that had been made by the attack of our ships, and new masses of supplies were pouring into Berlin in shipload after shipload from all the air-cities of the European Federation, to replace those we had destroyed in their great arsenals. The air seemed filled, indeed, with great freight-carriers and official cruisers arriving and departing. And beneath all this great surface activity and preparation, we knew, down in the great tube-propeller compartments of the air-city's mighty base, other and greater preparations were going on, other and different tube-propellers were replacing the city's tubes, and swiftly the time was approaching when all the city would be able to rush meteor-like through the air.

It was that knowledge that made our despair most deep. For though there was now a lull, apparently, in the great war's course, the European and Asiatic forces preparing for their final giant blow, and the Americans gathering their own forces apprehensively to resist the next attack, we knew that it was but the lull before the final terrible storm that was to settle the fate of earth's three mighty nations. And we knew, too, that it was the fate of our own American Federation that would be sealed in that gigantic attack, unless Connell could make his way soon to our land with his great secret. And that he could not do so, that he could not even escape from the little cell in which we were prisoned, was all so clear to us that almost I wished that death had come to me in the cruiser's crash to spare me the torture of mind that I and all of us were now undergoing.

It was a torture accentuated, I think, by the complete emptiness and eventlessness of those hours and days. Save for what we could see from our high window

THE letters that come pouring in, with praises of "Cities in the Air" are best proof to us of the approval of Mr. Hamilton's latest story. But the best part—the most intensely interesting as well as entertaining finale—is presented herewith.

Let no one think that, just because the theme of the author's story is so revolutionary, it may never come about. Stranger things have happened and more so-called impossible inventions have occurred during the past few hundred years than the basic idea of a city floating in the air. After all, everything is comparative. One hundred years ago, a person who had declared that it would be possible to transport ten thousand men in a single vessel, and carry them in a week from New York to France, would probably have been declared insane.

But such is progress. And it behooves us to be careful when we indict anything natural as being impossible.

upon the city around us, we were as cut off from the world as though upon the moon. Twice each day, at dawn and at dusk, our door was opened by the guards that brought our food, that food being as in our own air-cities the paste-like synthetic compounds of artificial proteins and fats and carbohydrates which had decades before replaced the old natural foods. But though our door was thus flung open twice each day, there was no hope of escape for us in that fact. For the two guards who brought our food in to us carried their heat-pistols always in one hand, and always, night and day, there watched in the corridor outside a full score of similarly armed guards by whom one could not hope to pass living toward the cage-lifts. It seemed indeed, as Connell had said, that weeks of frenzied meditation could never disclose any plausible plan of escape, and so I lapsed with him into a state of half-lassitude that had been induced by our utter despair.

And so days passed. Not even the prospect of our own deaths which I knew to be looming before us, was sufficient to rouse me from that lassitude, not even the fact that at the end of that fortnight, as I had guessed, the great attack of the air-cities was to be launched upon the American Federation, and that it was for that reason that our captors had given us that time.

Connell, Macklin, myself—we three had faced in our time perils and risks enough, but so overwhelming was the doom that hung over us and over our nation now that it stunned us, held us in stupefied despair. But one of us there was that was not so stunned, and that was Hilliard, my young second officer. His eager, restive nature, chafing at our imprisonment and at the thing that was looming for our land, resisted stubbornly the deep hopelessness that had settled upon the rest of us, and hour after hour he spent in pacing about the little cell, or in striving to devise some means for escaping from it. And at last, upon the fourth day of our imprisonment there in the tower, he turned suddenly toward us with an eager cry upon his lips.

CHAPTER VI
A Daring Venture

"I HAVE it!" he exclaimed. "A way that two of us can win free with—and maybe all! A chance out of millions, with death at the end of it, maybe, but a chance to get Connell and his secret back!"

"But how?" I questioned. "How can two of us, even, get clear of this cell?"

"The guards!" he exclaimed excitedly. "The two guards that bring our food each dawn and dusk—if we can overpower them—"

"It's useless, Hilliard," I said. "Even if we did overpower them we could not pass the score of other guards in the corridor outside, or the scores of others on its lower floors."

"But listen," he appealed, and then, as he went on to detail to us the plan that he had devised, I felt some slight measure of hope rising within me, saw that dawning hope reflected in the faces of Connell and Macklin.

"It *is* a chance!" he exclaimed. "And if we can do it, if I can get back to our own land, it means a chance still for the American Federation! For the European and Asiatic Federations won't be starting their attack for another ten days or more, their preparations not finished till then, and in that time by bending every effort toward it our own engineers could put the new tube-propellers in all our American air-cities! Could make those cities able to meet the enemy cities, attack when it comes!"

So, with that foremost in mind, we swiftly decided that upon that very evening, when our guards brought our food at dusk, we would put the plan into operation, would stake everything upon it. For even if but two of us could escape by it, if Connell could be one of those two, and could get back across the Atlantic with his tremendous secret, it meant a fighting-chance for our Federation. And with that in mind the rest of us were willing to take all chances, to dare all risks. Risky enough the thing would be, we knew, all depending upon what occurred in one moment of rushing action, and numberless were the features of it that might go entirely wrong and ruin us. But we steeled ourselves with the thought of what would become of our Federation if we failed. And so ready and tense with resolution we waited for the coming of dusk.

To me, through the remaining hours of that day, it seemed that never had the sun sunk westward so slowly. From our window we could see all the activities that went on in the great air-city about us, could see far across all this great mass of towers and streets and thronging crowds which hung here miles in the air above the earth, and could see those activities lessening somewhat as the long shadows of sunset fell across narrow streets and smooth plazas. In the great plaza beneath, at the foot of that electrostatic tower in which we were imprisoned, there rested always a number of great cruisers of the European fleet, reporting to the First Air Chief there in the tower's base, and now with the approach of night other cruisers from the swarming masses above the city were slanting down to rest upon the plaza. And these cruisers we watched with intent gaze as the sunset's light declined.

Outside in the corridor we could hear the occasional movement of feet as the score of guards there moved about now and then, but heard not the approaching feet of the two that brought our food. What if they were not to come upon this evening? Or what if more than two, or less than two, were to come? Either contingency would be equally ruinous to our plan, and with the passing of each moment we sat in an increasing agony of expectation, Connell's eyes burning, Macklin as imperturbable as ever, Hilliard eager and tense. Then at last, when the shadows of dusk were falling across the great city of the air outside, were deepening in our little cell, we heard voices outside, the greetings of our guards in the corridor, and then a moment later the solid metal door of our cell had clicked open. Then into the cell stepped our two usual guards with our food, their heat-pistols ready as always in their right hands.

The eyes of one warily upon us, the other took both of the metal containers of synthetic food and reached to place them, as usual, upon the lower bunk-rack, at the room's right hand side. Macklin was lying upon that bunk-rack having stretched himself out as though sleeping. The rest of us were lounging at the cell's other side, the second guard's heat-pistol watchfully upon us while the first reached toward the bunk-rack to place the metal food-containers beside the supposedly-sleeping Macklin's head. But as he placed them there, as he began to turn away from it, Macklin's hands shot suddenly behind his head as he lay there and grasped the arm of the first guard in a single movement, jerking him toward the bunk-rack! Like lightning the second guard turned with his pistol toward that sudden movement and as he did so, forgetful for the instant of the rest of us, we three had leaped upon him! And then as Hilliard and I bore the second guard to the floor,

wrenching the pistol from him, Macklin and Connell had jammed the first one against the cell's corner, with hand upon his mouth, and had him equally powerless!

The whole swift scene of action had taken but a flashing moment to carry out, and so lightning-like had been our movements, so careful above all had we been to gag with our hands the two guards as we grasped them, that no single sound save for a few low-choking gasps had come from them. And then, while with hands over their mouths and with all the strength of our muscles Hilliard and I held the two guards, Macklin and Connell were swiftly stripping their tight-jacketed green uniforms from them.

A moment more, and Connell and Macklin were swiftly doffing their own black uniforms of the American Federation and donning the green ones. Now came a restless movement of feet in the corridor without, and with the speed of utter necessity we took the two discarded black uniforms and forced them upon the two guards, holding them still voiceless and powerless. Then, that done, the two guards were as like in their black uniforms as Hilliard and myself; with Connell and Macklin, the latter having been chosen because of the similarity of his appearance to one of the guards, wearing now the guards' green uniforms. And now the very climax of our endeavor was come, that moment upon which depended all, for now, suddenly removing our hands from the lips of the two guards we held, we added our own sudden cries to theirs, and at the same moment Connell and Macklin, in their green uniforms, were engaging in a mock struggle with us and with our guards, whose din seemed terrific there in the quiet upper levels of the great tower!

Instantly as those cries arose there was a rush of feet outside and the score of guards there poured down the corridor and through the cell's door, to see four of us in black uniforms struggling apparently with two green-uniformed guards, who were in reality Connell and Macklin. It was the moment upon which all rested, and in that moment the score of guards acted as Hilliard had foreseen, gazing not in that wild moment of frenzied action at faces but at uniforms, seeing only in that first moment in the dusky cell four black-garbed men struggling with two green-garbed ones they had seen enter it but moments before. And, seeing this, they rushed upon us four black-uniformed ones, Hilliard and myself and the guards whom in the guise of aiding in the struggle we had held, and began to beat us back against the cell's end, totally forgetting in that moment the two green-uniformed men they were succoring! And in that moment, as they pressed us back, Connell and Macklin were stealing swiftly out of the cell, and down the corridor toward the hall of the cage-lifts!

For but a moment more did we struggle with our outnumbering opponents there, and then as they gripped and held the four of us helpless and jerked our heads up wild cries came from them as they saw the faces of us, saw that two of us were their own guards! Then the next moment, needing no other explanation of what had happened, they turned with their own black-garbed fellows, rushed out of the cell, slamming shut its door behind them, down the corridor and toward the cage-lifts after Connell and Macklin! We heard those cries re-echoed swiftly over all the mighty building, heard rushing feet and repeated calls on the levels of the great tower above and beneath us. And then, as we flung ourselves to our window, gazed downward, we saw in the next moment two green-garbed tiny figures issuing from the giant electrostatic tower's base far beneath us, running across the great plaza toward the nearest of the cruisers. They were Connell and Macklin!

I cried out with Hilliard hoarse words of encouragement, forgetful that none could hear from our terrific height, saw Connell and Macklin rushing up the slender gangplank in the cruiser's side and through its open door, saw that door slam shut behind them, just as from the base of the tower there poured out after them a flood of pursuing green-garbed figures. Those pursuers were raising their heat-pistols, and a hail of shining heat-cartridges were flying through the air toward the cruiser in the next moment, but as they shot toward it there came faintly up to us the droning of the ship's great motors and then with all the power of those motors in its vertical lifting tube-propellers it was rising upward, was lifting smoothly and swiftly upward toward us! And at the same moment the green-uniformed crowd of guards beneath were rushing across the plaza toward the other resting cruisers, were rushing within them to soar up after Connell and Macklin!

Up toward us shot the lifting cruiser of our two friends, though, up toward our little window, for such had been our plan by which two, escaping, might rescue the remaining two. But as it shot upward I looked down, saw beneath the scores of cruisers on the plaza rising now after it, heard through all the great tower and for far around it a great roar of rising shouts as the escape was discovered, saw the giant gleaming muzzles of the great batteries of heat-guns around the plaza turning swiftly upward on their pivots toward the rising cruiser of Connell and Macklin! And so the next moment as that cruiser shot up toward us, as I made out Macklin plain in its transparent-windowed bridge-room, driving it up toward us, I flung an arm outward from the tower to him, shouting in frenzied appeal.

"Back, Macklin!" I cried, with Hilliard crying too beside me, "No time to get us—*back home with Connell, for God's sake!*"

He saw my frenzied gesture westward, caught the meaning of my wild warning shout as the guns beneath swung toward him and the cruisers below rushed up, and I saw him hang there for a fraction of a moment irresolute, hesitating. Then the next moment, just as there came a swift-spreading thunder of detonations from the great heat-guns around the plaza he had whirled the wheel over and sent the great cruiser rushing away from the tower, sent it rushing westward through the dusk above the great air-city's gathered lights. In the next instant there shot through the air where it had been the shining heat-shells from beneath! And then as Macklin's cruiser rushed comet-like onward through the dusk the great heat-guns beneath were turning again toward it.

I cried out hoarsely as they thundered again, but with a whirl sidewise Macklin and Connell had evaded the rushing shells and were hurtling on. Now over all the great air-city, over all the mighty mass of Berlin was spreading a roar of alarm, and now the cruisers that had rushed up in pursuit were rocketing westward after that single fleeing one, the batteries beneath us holding their fire lest they strike their own pursuing ships. With our hearts pounding Hilliard and I saw that single little cruiser leap on, saw it shooting through the dusk until its gleaming shape was now far away from the great air-city, racing westward!

Swiftly, though, the numberless pursuing cruisers were converging upon it, and then, as we strained our eyes to see the flying gleaming craft, there came a greater thundering of guns as all the suddenly-alarmed batteries at the air-city's westward edge loosed their shells upon the fleeing cruiser! That cruiser seemed to halt for a moment unaccountably, there was a great blinding flare that could be made only by heat-shells striking, and then the cruiser, the cruiser that held Macklin and Connell and all the American Federation's fate, was reeling blindly downward and out of sight, whirling lifelessly downward toward the earth far below!

CHAPTER VII

The Great Movement Starts

STUNNED and stupefied, Hilliard and I gazed out in that moment from our window, out through the dusk above the air-city to where the cruiser of our two friends had plunged to death. I think now that for those first few moments neither of us was able completely to comprehend what had happened, to comprehend what malign fate it was that had sent our friends down to death there as they seemed making their escape. Staring forth blankly, we saw the cruisers that had been pursuing them, that had been overtaking them, turning back now toward the air-city, heard a cheer rolling across that city as the crowds in its streets witnessed the destruction of the fleeing craft, the flare of the shells that had destroyed it. That great roaring cheer from beneath penetrated at last into my brain with realization of what had happened.

"Macklin—Connell—" I whispered. "Macklin and Connell—gone—and the last chance to warn our Federation gone—"

Hilliard's eyes were bright with unshed tears. "Our last chance," he said.

Looking back, I think now that it was not the passing of our one chance for freedom, nor the passing even of our one chance to carry Connell's great secret homeward, that weighed upon us most in the following time. It was the swift passing of our two friends, of Macklin especially, who for long had formed with Hilliard and myself the trio that commanded my cruiser, that stabbed us most in those first following hours and days. Prisoned there as before, but two of us now where there had been four, we waited now in a certain heedlessness for the doom that we knew awaited us and our Federation. The wild break for freedom that two of us had made and that had ended in those two's destruction, had apparently not changed the plans of the European First Air Chief in regard to us, and we knew that at the end of the designated fortnight, less than ten days hence now, we must either reveal all our knowledge of the American forces, which we could not do, or suffer death.

We knew, too, that even as Connell had guessed, it was at the end of that fortnight, ten days hence, that the European and Asiatic Federations planned to launch their final gigantic attack of air-cities, since it was evident that they wished to gain their information from us only to use it immediately in their attack. For now below, in the city's base-compartments, the great new tube-propellers that were to whirl it through the air at such terrific speed were being completed, we knew, as in all the two hundred air-cities of the European and Asiatic Federations. The long months of experimentation over, it needed but weeks or days to rush those new tube-propellers into place. And had Connell escaped with his secret it might well have been, I thought, that even in the ten days left the new-type tubes could have been swiftly manufactured by thousands and placed in all our own American air-cities.

If Connell had escaped! But Connell had not escaped, Connell had plunged to death with Macklin, amid the flaring heat-shells. Prisoned there in our little cell, Hilliard and I despite that ever-approaching doom almost paid no attention whatever to all outside and about us, brooding there in silence hour upon hour as night followed day and day night. We had not, even, the slightest further thoughts of escape, altho such thoughts would have been hopeless, for now our door was never opened save by the full score of armed guards outside. So, losing all thought and all hope of freedom, we sat on in our little prison high in the mighty tower, dead to all the unceasing rush of preparations and gathering of cruisers in the city about us.

But at last, upon the eighth day after the break of Connell and Macklin, and the second day before our approaching doom, there came an event which roused us suddenly from that renewed apathy into which we had fallen. For days we had noticed that the crowds in the streets were proving fewer and fewer, the only people now remaining being groups of green-uniformed officials unceasingly moving in and out of the headquarters there. There was finally made clear to us the reason of their activities. For, as we gazed forth from our window on the afternoon of that day, we seemed to sense a certain air of anticipation in the people that remained. They swarmed forth into the great air-city's streets; we heard in a moment more a strange great hissing from far below us, all around the city's base and edge; and then were aware that with that hissing sound and with a great tremor of power that beat through all its colossal metal mass, the great air-city was moving! Was moving not slowly and majestically as air-cities commonly move, but was leaping forward through the air with sudden tremendous speed. We knew now that most of the city's population had been removed to the ground and the movement toward the west had started.

Now came excited roars from the crowds beneath, as the giant mass that was Berlin leapt forward, and now as Hilliard and I leaned from our window with an excitement almost as great we caught our breaths. For we could see now, from the cloud-masses that lay beneath in the distance, that the great air-city was cleaving the air at a speed that was rapidly mounting to over a hundred miles an hour. Terrific winds were whirling all about our power-tower, as it shot through the atmosphere, and those same winds sweeping with titanic force through the city's streets and about its towers forced the crowds in those streets swiftly within the shelter of the structures. And still at ever-mounting speed, the hissing of power and the tremendous roar of winds increasing still, the mighty air-city was whirling on, its soaring towers of metal swaying back beneath the awful winds of their progress, whipping through high cloud-banks and out into clear air again, giving us flashing glimpses from our own wind-swept window of the ground, far outward and beneath flashing back at immense speed as we shot onward, as all the colossal city sped on, at a velocity that I knew by then must be over a hundred and fifty miles an hour!

A colossal city, speeding through earth's atmosphere! Awed, despite ourselves, Hilliard and I clung at our window there as with all else in the city we sped on. A colossal city five full miles in its diameter, with all

its works and streets and giant batteries of heat-guns, and rushing above earth at a velocity seeming almost unattainable! And even as we watched, we felt the great city slanting upward with the same terrific speed, climbing swiftly upward until the air about us was all but freezing and then diving down toward earth once more on a long, gliding swoop! Then it had turned in mid-air, was flashing back over its course, was going through maneuver after maneuver until at last the great hissing from its base ceased, and it hung at its former height above the earth once more, the crowds in its towers surging forth now to renew their excited shouts.

Last Preparations

HILLIARD and I gazed for a long moment at each other. "The tube-propellers they were putting in —finished—," he said slowly, "And Berlin ready now for the great attack—"

"And all the other European Federation cities," I said, "and all those of the Asiatic Federation—all must be nearly completed now, their new tube-propellers installed also. And in two more days——"

In two more days! It was the thought that beat hammer-like in my brain and in Hilliard's in those hours that followed, those hours that were now closing down, one by one, upon the doom of ourselves and of all our nation. Two more days! Two more days at the end of which would have ended the fortnight of our imprisonment, when would come for us the death that had loomed larger and larger during each of those passing days. Two more days at the end of which the great air-cities of the European and Asiatic Federations would rush like whirlwinds over the oceans toward our own slow-moving and helpless cities, to beat them down with all the thunder of their giant batteries. Two more days!— and at the end of them for us and for all the great air-cities and all the millions of the American Federation, doom!

It is not to be wondered at, therefore, that in the following hours, Hilliard and I felt close about us the intense despair that ever since the ill-fated attempt of Connell and Macklin had surrounded us. Through all that night following the first demonstration of the immense speed of the air-city, we sat awake, listening to the great shouts of triumph and exultation that came dimly up to us from the crowds that remained in the streets far beneath. The European Federation, we knew, already felt the glow of imminent victory that this new speed of their great air-cities would give them, and were exultant at the chance to annihilate completely the hated American Federation. And, to accomplish that, the very last great preparations were going on now in every part of the air-city.

Great loads of shining heat-shells were being transferred from the stores that had been brought to Berlin, to the giant batteries of heat-guns around the city's edge and its central plaza around the electrostatic tower. The cruisers of the European battle-fleet, still some two thousand in number, were resting on all the landing plazas, and were being cared for and inspected by hordes of green-uniformed attendants. All other air-craft were lowered into the great city's base-hangars to be out of the way during the oncoming combat. By a stroke of genius on the part of Berlin's commander, the power of the great air-forts had been added to that of the city itself, by simply placing the air-forts here and there on unused landing plazas, where they formed in effect great armored gun-turrets on the city's surface. And, finally, the mighty city's speed and power to maneuver had been tested rigorously. With all its peoples inside its metal towers, it was shot at terrific speed low and high above the earth; turning and dipping and rising at that awful velocity like a flashing airplane rather than a gigantic city of the magnitude it really had.

Through all the hours of that night, and the next day (the thirteenth of our imprisonment) those great preparations, that unceasing rush of excited activity, continued. Night came, and still the last preparations were to be made; magazines were being filled, and green-uniformed figures were swarming in countless numbers in the streets; going about their maneuvers; battle-cruisers were moving ceaselessly across the sky. During the hours of that night, as Hilliard and I sat silent there, high above all the tremendous turmoil of the streets and plazas below, we sometimes raised our eyes to watch also the calm, slow march of the great constellations across the sky above; glittering groups of stars that seemed to look down with cool and contemptuous eyes upon all this mad flurry of human excitement and human endeavor. Dozing a little now and then, we sat there until at last dawn sent its rosy light across the world. It was the last dawn, I knew, that Hilliard or I would look upon.

Now, it seemed, all the preparations in the giant air-city about us were completed. The crowds that had moved in its streets during the day and night before remained, but silent now with the thrill of approaching combat. Tense and silent the city remained, as the sun crept up toward the zenith through the morning hours of that fateful day. And, high in our tower-cell, Hilliard and I found ourselves gripped by the same tense feeling of anticipation. From our window as we watched the city, we made out the west, a dark spot rushing through the air toward Berlin, a spot that was growing steadily larger in size, that was broadening out into a large dark disk; and then as it came swiftly closer we saw with astonishment that it was a city, a giant air-city almost as large as Berlin itself!

The Gathering of the Cities

WE heard a stir of excitement in the streets below as that mighty air-city came closer to us; then saw it slowing down until at last it had come smoothly to rest out to the south of Berlin, hanging there in mid-air a half dozen miles away. It was London! Even as I had recognized it, Hilliard had done so also. London! The great air-city that held all southern England for the European Federation, could be clearly recognized, not only by its size but by the somewhat different architectural design of its metal towers and plazas. We could make out clearly now the surface of the other city, its huge batteries of heat-guns, and its great towers surmounted by a central pinnacle. And now, as we scanned the horizon away to the north, we could see another dark disk, another mighty air-city, rushing swiftly toward us!

"They're gathering!" Hilliard's voice was agonized. "Gathering—all the air-cities of the European Federation! It's the beginning of the end."

"Gathering for their great attack," I said.

"God, if Connell and Macklin could have escaped!" Hilliard's cry burst from his tortured soul. "If our own air-cities had only the speed and the power to resist this attack!"

"Steady, Hilliard," I told him, my hand on his shoulder. "It's the end, I think—the end for our Federation as well as ourselves—but we must face it."

Now the air-city from the north was rushing closer,

was hanging northward of Berlin, and we saw that it was Stockholm. And, even as it came to rest out there beside us, two other air-cities were rushing up from the south; looming larger swiftly and identifying themselves, when they too shot up to hang near our central city, as Geneva and Rome. And then from the west were coming others, Paris and Brussels and Amsterdam; while down from the cold east were speeding Moscow and Helsingfors and Leningrad. City after city was rushing from all quarters of the compass, from every part of the European Federation, until they filled the sky. Through the hours of that afternoon we watched their numbers grow until they numbered over a hundred. They had come from every part of the earth, over which the European Federation held sway. From the bleak eastern steppes, from the jagged peaks and green valleys of the Pyrenees, from the great ice-locked fiords of the north and from the blue plains of southern Africa, they were rushing at colossal speed to gather here in a great circle about their capital city—Berlin! Great air-cities, each of which flashed through the air at the same tremendous speed, each of which bore upon it great batteries of those giant heat-guns that nothing else in the air could sustain, each of which held upon it a soaring electrostatic tower and thousands of other clustered pinnacles. As in Berlin, the crowding, seething millions of its peoples had been left on the ground quarters prepared for them. The gathering of the cities! At last, with the coming of sunset, all but the last few of the Federation's mighty air-cities had gathered around Berlin!

By then, gazing out from our window high in the electrostatic tower, Hilliard and I seemed to be looking across a single gigantic city that stretched in mid-air as far as the eye could reach, so closely were the scores of great hovering air-cities hanging together! It was as though we were looking forth across an endless plain of clustered towers of metal, from which rose here and there the higher pinnacle of a city's power-source; a titanic plain of towers and streets of metal, crowded with millions of the European Federation's soldiery. And, as the blood-red sunset flamed eastward upon all this huge assemblage, now waiting only for the last of their number, something seemed to snap in my brain, and all the stoicism which I had summoned to meet our fate and our nation's fate abruptly vanished.

"We *can't* stay here while doom rushes upon our nation!" I cried madly. "Since they start out tonight—since our time is up and we die ourselves tonight—we'll go to death fighting for our freedom!"

But, now, it was Hilliard who endeavored to calm me. "It's useless, Brant," he said. "A few hours more; then all will be rushing west while the Asiatic Federation is moving east upon our air-cities. And at any moment now, before that attack starts, they will be coming here for us."

"But they'll not take us to a death like that!" I exclaimed, a cold, long-repressed fury surging up within me. "If we're to die we'll do it, striking a blow at our enemies!"

Like a caged tiger I paced the little cell's interior, growing shadowy and dusky now; the sun had disappeared. From the corridor outside came the voices of the guards, and at any moment I expected the door to swing open and admit those who would take us to a last examination at which our silence would bring immediate death. Already, far out over the great mass of scores upon scores of giant air-cities that filled the air about us, a great, complicated pattern of brilliant lights was gleaming through the deepened twilight; and now, from south and east and west, the last of the great European Federation's air-cities were assembling about that tremendous gathered mass of cities. Then, as I turned from the metal door which I had been examining in blind and futile rage, my eyes fell upon our bunk-racks and the strong but slender strips of metal that held them out from the metal wall, against which they were set diagonally. And, as I looked at them an idea, a last flame of hope, burned into my brain, and I turned swiftly to Hilliard.

"Those strips of metal!" I exclaimed, pointing toward them. "Those bunk-supports—it's a chance to escape! A chance that means death, Hilliard, I think—but death is upon us now in any case—"

Swiftly, almost incoherently, I explained to him the idea that had suggested itself to me. I heard his breath catch as he comprehended its appalling nature. Then I saw his eyes gleam as he realized that, inasmuch as almost certain death awaited us, death in escaping could not deter us, for we were already doomed. So, we grasped one of the metal strips and tried with all our force to tear its lower end loose from the metal wall. That lower end, set directly in the wall, seemed integral with its metal; and, as we pulled upon the metal strip, gasping with our great effort, muscles tired, we still kept on. We had to work quietly lest some sound betray us to the guards without. It seemed that we could never tear it loose. Straightening from the violent exertion, with dizzy heads, muscles aching, we paused for a moment, then reached to grasp the strip again, braced ourselves against the wall and exerted all our force upon it. It held for a terrible moment, then seemed to give, to bend—and then, with a little grating sound, we had pulled the strip loose from the wall into which it had been set.

CHAPTER VIII
A Single Chance

INTENTLY for a moment we listened without moving; but there came no sound of alarm from without, nothing but the occasional voices of the guards. And now we grasped another of the metal bunk-supports, and wrenched its metal strip loose from the wall with another tremendous effort. We had in our hands two metal strips, each of some three feet in length. These we now bent swiftly into two L's or right angles of equal sides, using all our combined strength on each to bend the strong metal. Then, swiftly loosening the long, strong leather belts that criss-crossed over our black air-jackets, we formed of them swiftly two leather ropes ten feet in length. Each of these we attached to one of our metal L's, making each fast to one of the jagged, broken ends of one of the bent strips. Then, panting from our swift efforts, we stood erect, and moved toward our little window.

Night lay over the world now, and from our window we saw the cities illumined by their lights stretching out to the horizon. On the landing plazas of the air-city beneath us rested the great European Federation battle-fleet. In the plaza directly beneath us, that which surrounded the base of our great electrostatic tower, there rested but a few score of cruisers, those of the commanders who were now at the headquarters inside the great tower's base. The plaza was practically deserted; for it was the evening meal. For a moment I stood there at the window, gazing out over that tremendous mass of giant air-cities. Then, summoning all my courage, I flung my right leg over the window's base, through its opening.

Sitting astride that opening, while Hilliard watched anxiously behind me, I placed the metal angle I carried upon the flat metal sill of the window, one end of its angle catching on the sill while the other end, to which my leather rope was fastened, pointed straight downward toward the great plaza a thousand feet beneath. Then, holding to that leather rope, I slid out of the window's opening; and hung by my hands from the slender rope with only empty air between me and the plaza far below. Tensely I swung there in that moment, but the metal angle caught in the sill held my weight. And so, sliding down the leather rope fastened to it, I felt my feet strike in a moment against the sill of the window below. Another moment and I stood upon that sill, crouching within that window's opening.

The window in which I crouched opened into one of the great upper corridors of the electrostatic tower; but I knew that to venture back into the building, swarming now with guards, was to meet death, nor did I plan to do so. Giving my leather rope a twitch, I worked loose the angle resting on the sill above; and, when that dropped toward me, I placed it on the sill on which I stood, and the next moment was sliding down to the window below. And now above me Hilliard, using his own metal angle and leather rope in the same way, was following me, was sliding from window to window after me, down the smooth side of the mighty pinnacle to the street far below. Down—down—like two strange insects we crept downward from window to window. None in the streets below glimpsed the two tiny shapes crawling down the mighty tower's side; for the darkness had deepened now, and in the plaza directly beneath us there were none of the crowds that swirled elsewhere.

Our greatest danger, indeed, was that we would be seen by someone inside the tower as we swung down from window to window; and twice I was forced to hang for a few seconds from my leather rope above a window inside which I could hear voices. Yet still down and down we swung, praying that the regular line of windows in the static-tower's side, extended unbroken clear to its base; for otherwise we were lost. Down and down we went, moving more hastily now despite the awful hazards of our progress; so hastily that once Hilliard's hook or angle slipped halfway out from the sill upon which it hung, and all but precipitated him down to death before he could slide into the window beneath him.

But now we were within the last dozen levels of the plaza's surface, and were down with all the eagerness of renewed hope. For in the plaza there beneath us there lay still the unguarded cruisers, their officers and crews gathered in the great tower down which we were creeping. Another level—another—and down we swung through the dusk, in such a descent as surely man never had made before. The plaza was close beneath, the window of our cell now far above. From far around that plaza, from Berlin and from all the air-cities about, we heard the great hum of final preparations being made. I knew they were ready now to sally forth upon their gigantic attack. But we were within the last few levels of the plaza, now, swinging down with mad haste from window to window toward its smooth surface. And then it was, when we were within a few yards of that surface, that I heard a dim cry from far above.

"Down now with all your strength, Hilliard!" I cried to my friend above me. "They've come to our cell after us—are giving the alarm!"

"The nearest cruiser there below!" he exclaimed thickly as he swung madly down after me. "We'll make it yet!"

But now the cry of our guards high above was being taken up and repeated by other voices in the great electrostatic tower. That cry was coming down through it from level to level, even as we swung from the last window to the level plaza. And, as we staggered across it, toward the open door of the nearest cruiser, there came a series of popping detonations from above and the next moment little flares of terrific heat were bursting all about us as the guards shot their heat cartridges down toward us! From their great height and through the dusk their aim was poor, and in a moment more we were at the cruiser's open door. But now the alarm was spreading over all the tower behind us, and at the same moment that we flung ourselves in through the cruiser's open door, slamming it behind us, we heard a wild clamor of voices from the power-tower's base!

The next instant, though, we were bursting up into the cruiser's bridge-room and for a moment of agony I fumbled at its controls, set differently from those of our American cruisers. Then the motor-stud had clicked beneath my fingers and, as the great electric motors beneath droned suddenly loud with the current rushing through them, I sent all their power into the cruiser's tube-propellers. Up it went rushing, up and away at terrific speed and at a steep slant, even as a mass of green-uniformed figures burst from the electrostatic tower into the plaza! Out and over that plaza at terrific speed we shot, out and upward at such awful mounting velocity that, before the great batteries of heat-guns around us could turn, before the alarm from the power-tower had time to spread, we were whirling up and through the dusk over all the massed towers and gleaming lights of the great air-city Berlin!

Out and over—and now as we soared upward into the rarefied levels of the air like a shooting-star, our cruiser was driving outward over the cities, stabbing westward through the air, literally chasing the sun that had disappeared hours before. From Berlin behind us there rose a hundred cruisers, soaring in swift and deadly pursuit! But so swift had been our rush, so tardy had been the alarm of our escape, that before the great batteries of Berlin could blast us from the air we were beyond them; and before the other massed air-cities over which we were rushing could receive that alarm we had split the air westward above them, and had rushed out from over the last of their titanic floating masses and into the night!

"We're clear of the cities!" I yelled to Hilliard over the thunderous droning of our motors and the roar of winds about us. "If we can shake off these pursuing cruisers we'll win back across the Atlantic yet!"

"But their whole battle-fleet is rising now!" cried Hilliard, gazing back. "And now all their air-cities are beginning to move westward too—*all their hundred air-cities are moving west to the attack!*"

Across the Atlantic

DESPITE the wild peril of our rushing ship, I felt for a moment all the blood congealing around my heart as Hilliard yelled those words, and I looked backward for one last glimpse. For there, behind us, behind the hundred ships that were pursuing us, the whole two thousand cruisers of the European battle-fleet had risen and were coming westward also. They were not pursuing us so much as they were speeding westward according to their plan, moving after us in a great crescent formation! And, behind them, we could see now all the hundred gigantic air-cities of the European Fed-

eration, massed there in a colossal circular formation about their central city of Berlin; moving westward also behind the crescent of their fleet, they were flashing with terrible majesty through the air in their circular-massed formation; at a speed that mounted swiftly to two hundred miles an hour!

The great attack had begun!

Only a moment I gazed back upon that colossal spectacle never seen by man before, and knew that in that moment, far on the world's other side, the hundred great air-cities of the Asiatic Federation would be rushing eastward; the two great forces of hurtling air-cities were converging upon the American Federation. Then, as we shot forward with our own greater and terrific speed, the vast massed cities and the fleet before them had passed from sight behind us and only the hundred grim pursuing cruisers were visible in the night as we hurtled on!

On—on—and now I shouted to Hilliard to go beneath to the cruiser's motor room. He moved down toward them while I gripped the wheel tightly, standing there alone in the bridge-room of the long great cruiser that had but Hilliard and I inside it. And, while we hurtled on at our maximum terrible speed, as the cruisers behind drove steadily after us, we realized that we and our pursuers were outracing the sun around the earth! We saw by the growing light that we were high above the sea instead of land. The sea that we saw through breaks in the vapor-layer, gleamed to the west of us with sunset lines. We were over the Atlantic, and now, as hope of escape from our pursuers burned stronger within me, there came a sudden faltering in the steady drone of our great motors! I felt our cruiser lose speed in that moment, knew that faltering to be caused by the circuit-breakers tripping at the tremendous power we were using. But then after an awful moment of hesitation the motors were droning as loudly as ever as Hilliard, beneath, had thrown back the circuit-breakers in the connections that conveyed the static electricity from the atmospheric charge about us to our transformers. Only a moment had we faltered thus; but in that moment the hundred pursuers behind had come swiftly closer!

Onward still, like some phantom, we rushed, minute after minute of droning, racing flight, with the sunset ahead flaming brilliant now, as we overtook it. Steadily, the long gleaming ships behind us were creeping closer while the sun rose in the western sky. Though Hilliard was working like a madman in the motor-room beneath, tending the motors as a mother anxiously watches her child, he was but one and could not do the work of a dozen. And so, on after us, they came; drawing toward us so close that at last I knew that we could not win free of them in our frenzied flight. For, although we had rushed on for a time that seemed endless to us, and a few hundred miles remained between us and the American coast, their leaders were so near now that another minute, I knew, would find them using their bow guns upon us.

Even as the thought came to me, there was a thundering detonation behind us and then but a few feet to either side, a shining heat-shell flashed past us. Another detonation, and another followed, and I knew that not for long could we escape them thus; since with each moment the shooting was becoming more accurate. So, just as a dozen of their bow guns thundered again, I suddenly drove the cruiser downward in a flying headlong plunge down through the vapor-layer beneath us; and, as the pursuing ships plunged straight down after us, I sent our own cruiser instantly whirling upward and through that layer once more!

It was a maneuver that gained us a moment's advantage; since when the pursuing ships drove up through the vapor-masses again on my track, it took them an instant to locate and shape their course after me. In that instant we had moved a little from them; but now, remorselessly as ever, they came on after us, as pursued and pursuing ships drove like light toward the flaming western sky. On and on, on until again they were close behind, until again their guns were beginning to thunder, and then I repeated my former maneuver, my last resort. I dived headlong downward again through the vapor-layer, and upward again, as their ships drove after me. But, when I flashed up again through the vapor-masses this time, I suddenly slowed my ship, slowed it and then held it motionless there in mid-air, with cold of icy fear tight around my heart in that moment! For, this time, half of the hundred pursuing ships had not dived down after me but had flashed on ahead as I drove down; and so, now, when I flashed up they hung before me, while the remainder drove still toward me from behind! I was trapped at last between their masses of ships before and behind me!

Slowing my cruiser, holding it motionless there with mechanical fingers in that moment, I knew it to be the end. Our last moment had come. The two masses of ships were moving toward me, from ahead and behind, were moving toward our cruiser. Our only escape cut off, no twists or turns now could save us; they were converging upon us, were moving deliberately toward us from either side. Another moment, I knew, and hundreds of heat-guns would thunder from them, hundreds of heat-shells would send our ship downward in flaring, fusing destruction. Another moment—

A great cry sounded beside me, and I wheeled to find Hilliard pointing mutely upward toward a mass of long, gleaming shapes that were rushing headlong down upon us from high above, that were diving headlong down upon the European cruisers to east and west of us, raining a hail of heat-shells upon them! "American ships!" My cry was echoing Hilliard's. Great gleaming cruisers, outnumbering the hundred east and west of us, were driving down upon those hundred with all their heat-guns thundering! Then in the next moment, while our own cruiser hung motionless, helpless there in mid-air, American and European cruisers were whirling in a mad, swift battle about us, ships striking and falling like lightning on all sides of us. And before we could comprehend with our stunned minds what was taking place, the European cruisers had suddenly dropped from that battle, had massed together and were splitting the air eastward, rushing back eastward and disappearing toward the mighty approaching armada of great air-cities and cruisers of which they were the scouts.

Now from the mass of the American cruisers one shot toward our own, level and hung beside our own ship, and as its door was flung open we opened the door of our own. I stared at a tall figure, not crediting my eyes.

"Macklin!" I cried as I recognized him: "Macklin! You got clear, then?"

"Brant—Hilliard—!" he was himself exclaiming: "It is you two in that ship, then! We were sent on a last patrol out here, saw your ship attacked by other European ships, came to your rescue—"

"We escaped from Berlin," I told him: "But you, Macklin, we thought you and Connell dead, saw your cruiser struck by heat-shells and falling—"

"It was a last ruse," Macklin swiftly explained: "Those pursuing ships were overtaking us; so, when their batteries fired a storm of heat-shells after us, we fired one of our own heat-guns back toward them at the same time, and our shells meeting one or two of the oncoming ones made them burst and flare there behind us. Then, at the next moment, we sent our ship whirling down as though struck and destroyed."

"But Connell, then!" I cried: "Connell got back with his great secret. All the hundred European Federation air-cities are rushing across the Atlantic to the attack!"

We leaped across the gap to the gangway; the door of Macklin's cruiser closed behind us; and he gave the order that sent it, with the whole cruiser fleet; westward at swiftly mounting speed. Then he turned back to us.

"Connell got back with his secret, yes," he said: "And though the hundred European Federation air-cities are rushing westward and word has come that the massed hundred Asiatic Federation cities also are rushing eastward for the attack, they will find the great air-cities of the American Federation massed together and ready for them! In the ten days since our return, every effort of our cities has been exerted to make use of Connell's knowledge, and to equip with the new tube-propellers that will give them the same tremendous speed as our enemies. And now all our cities are massed together and waiting for the attack of our enemies."

CHAPTER IX

The Battle of the Air-Cities

NOW the hundred cruisers of our force were cleaving the air westward at terrific speed, while Macklin and Hilliard and I stood together in the bridge-room of the foremost as it rushed on. Beneath us, the gray Atlantic showed here and there through openings in the vapor-masses, and ahead the sun still hung in the western sky. And within a few minutes more, we saw that the vapor-layer beneath was thinning, and that now we were flashing not over the sea but over land; over green hills and valleys that we could glimpse rushing past far beneath us. I gazed to north and south in search of New York and the other coastal air-cities that should have hung there, but nothing was in sight.

"All our American Federation air-cities," Macklin told me: "are massed together, hanging south of the Great Lakes. From Buenos Aires to Winnipeg, they've come"

"You think, then, that the European and Asiatic Federation air-cities are going to make a simultaneous attack from both sides?" I shouted to him above the roaring of our flight. He nodded emphatically.

"Undoubtedly. The Asiatic Federation cities are over the Pacific now, and are keeping in touch with the European ones by distance-phone to time their attack to coincide from east and west. They know our own cities have massed together, must know now that they've been equipped with the great new speed-tubes also; but they're coming on."

"Two to one," I said: "Two hundred air-cities attacking our one hundred. God, what a battle it will be!"

But now Hilliard had broken into our conversation, was pointing far ahead toward a dark, flat mass that stood out against the brilliant western sky, and toward which we were moving. The terrific speed at which we had been racing on for hours was decreasing now. Far beneath the land was still rolling back at great speed, long green plains now; since already we had flashed west over the Alleghanies. Then, as the dark mass westward grew steadily with our approach to it, other ships were driving suddenly beside our own, watchful patrols that drove down upon our hundred cruisers and swiftly challenged them. Macklin answered those challenges by the distance-phone, but for the moment I paid small attention to him, gazing forward with heart beating rapidly at the great mass that hung high in mid-air before us. For, as we drove closer toward that mass, it was becoming visible to our eyes as our goal, the hundred giant air-cities of the American Federation!

The hundred mighty American Federation air-cities were clustered there miles above the green plains, in a great circular mass, with New York, most colossal of all of them, at the center! Cities that had long hung over North and South America from sea to sea, air-cities whose names were those of the long-vanished cities of the land, that once had dotted the surface of those continents. Boston and Los Angeles, Rio de Janeiro and Chicago, Mexico City and Quebec, Valparaiso and Miami—these and scores of others hung there in that great cluster. All the air-cities of the American Federation were gathered here about their air-capital of New York to withstand the tremendous attacks now closing in from east and west!

Massed there as they were, the hundred mighty air-cities seemed, even as the European ones had seemed to me, but one vast plain of metal towers and streets. As far as the eye could reach, there stretched away the tremendous forest of those soaring towers, with here and there rising from them the taller spires of each city's great electrostatic tower. And, everywhere among those towers, everywhere around the rim of each great circular air-city and at its center there loomed great batteries of giant heat-guns; while here and there, on the plazas of the cities rested the turret-like cubes of the recalled great air-forts, their own grim heat-guns protruding expectantly. And through streets and towers, between the batteries and around the air-forts and across the plazas of the assembled cities, there swarmed the millions of their peoples, wild with excitement now as the last dread hour approached. And, massed there above all the great floating cities, hung grim and motionless the two thousand or more cruisers that still remained of the American Federation's eastern and western fleets.

It was toward these massed battle-cruisers, at a level somewhat higher than that of the air-cities, that our own hundred cruisers were rushing. Over those assembled giant cities we raced, the great mass of them below us almost hiding the ground beneath. As we shot above them, I saw now that they had been ranged in a tremendous circle, the great capital of New York hanging in the center. Across the great ring of the air-cities we rushed; were racing at last above New York, toward its own giant power-tower. Then we had reached it, and were sinking vertically downward, until our hundred cruisers came to rest upon the central plaza. Here, even as in Berlin, the central plaza was reserved always for the ships of the First Air Chief and his followers; so that, although immense crowds now beat through all the streets and plazas about it, there were none around our hundred ships. And in an instant Macklin and Hilliard and I were out of that which had brought us and hastening across the clear space toward the static-tower's base.

Preparations

ON past its guards and through the ante-rooms we strode, and in another moment were in the office

of the First Air Chief. There was unfamiliar apparatus among the great switchboards of its walls, I noted as we entered. The First Air Chief himself had risen from his great table-map as we entered and was coming toward us; beside him, another figure, whom I recognized instantly as Connell. Then both of them were grasping the hands of Hilliard and of myself.

"Brant!" Yarnall was exclaiming: "I got Macklin's report of your escape and his rescue of you—man, but I'm glad that you got free! And it was what you did there in Berlin, what you did to help Connell and Macklin escape, that has enabled us to use Connell's knowledge and fit our air-cities for the coming battle!"

"I did no more than the others," I told him: "But you know of the enemy's coming then? You know that already the European Federation cities are on their way?"

He nodded. "They and the Asiatic Federation's cities from the westward, Brant," he said: "And we are awaiting them here—awaiting them with a chance at least, thanks to you four—to strike back at them when they come. And already they are near—by the map here you can see—"

And he turned toward the great table-map upon which was depicted the whole of the earth's surface, the red circles upon it denoting as before the position of the air-cities that hung above it. Now, however, all the circles of the American Federation cities were massed together south of the white outline of the Great Lakes, hanging motionless as the cities around us were hanging motionless. Away to the east on the map, though, just moving in from the Atlantic over the eastern coast, there was creeping across the map another mass of red circles, moving slowly toward our own, that represented the great gathered cities of the European Federation that were rushing westward toward us. And in from the Pacific was creeping a similar mass of a hundred little red circles that were, I knew, the Asiatic Federation's cities.

From east and west they were moving, there on the map, moving even as the cities they represented moved through the air, automatically showing their positions and progress. This was accomplished, I knew, by means of special batteries of cruiser-finders, tuned and trained to detect the great electro-static motors of air-cities, and recording instantly thus whenever those cities moved with their great electric fields. Their records were carried through complicated mechanical calculators which plotted the exact positions and movements of the cities; and these calculators, in turn, were connected to small special projectors set beneath the great ground-glass table-map, casting upward upon it the red circles of the air-cities. Thus those red circles moved upon the map, even as the great air-cities moved across the world.

This arrangement, indeed, was of no late date, and was used by both European and Asiatic Federations as well as by ourselves; but as I gazed now about the great circular room I saw that within it were some new arrangements also. These consisted of a series of six great glass screens which were arranged in box-like form about the great air-city's controls at the room's center. And, while the First Air Chief swiftly explained to us their purpose and design, I saw that one sitting inside their box-form, with four on four sides, and one above and one below, could see in all those directions as though from the very top of the great power-tower. For they were in effect great electrical periscopes; four great similar screens had been set on four sides of the electro-static tower's high tip, and another one above that tip, while the sixth had been set in the under-side of the great city's base. The views possible to those six screens were then transferred down to the six there about us; the light-vibrations that struck the screens above and beneath being transformed by television receivers into electrical vibrations and brought down to television reproducers behind our own six screens.

Sitting there at the city's controls, amid those six screens and looking into them, one could see as clearly as though from the power-tower's tip in all directions. It was quite necessary, too, that this should be the case; since the man who operated the great air-city, from its six direction-controls and its single speed control there, must see clearly in all directions, now that the great air-cities could rush at such tremendous speed through the air. When I said as much to the First Air Chief, who had turned now and was gazing intently at the great table-map upon which the eastern and western masses of circles were slowly creeping toward our own, he nodded, and contemplated me for a moment with a curious expression.

"The man," he said finally, "who is to hold the controls of New York in the battle tomorrow, will be you, Brant!"

"The honor is great," I said: "I've operated the city's controls, though never did I expect to take it into battle. But Macklin and Hilliard here—I want them to stay here for the time being—I want the hundred cruisers on the plaza outside to stay there during the battle."

"You have a plan?" the First Air Chief asked, but I shook my head.

"No more than an idea," I said: "An idea that may help us if the battle goes against us, if their attack is too strong for us. Even then it is too insane, perhaps, to be of any use, but it might help us—"

Yarnall nodded assent, and then Macklin and Hilliard had joined the two dozen or more of black-garbed attendants and engineers who were busy at the great switchboards that lined the circular room's walls. They scrutinized its dials to determine the rate of the vast currents rushing down from the power-tower's tip far above to the motors in the city's great base; added a fresh battery of transformers or threw in resistances to hold that current steady; and moved ceaselessly about the walls in their anxious watch. Now, Yarnall and Connell and I were marking our own places, the three metal seats there behind the big table-map, with the great screens of the electrical periscopes all about us. Yarnall would sit in the center, with eyes upon the red circles on the great map, tensely watching their progress, as admiral of our mighty fleet of colossal cities, ready to direct it and our cruisers to the battle. Connell would be at his right, before him the black mouthpiece and speaker of a single distance-phone. Behind that were the scores of switches and intricate controls, which connected that distance-phone to the operators of all our hundred air-cities.

The Battle Nears

AS the third of the trio, I would sit at Yarnall's left, before me the six switch-levers which sent the colossal city of New York whirling through the air in any direction; while beside them was the gleaming knob which regulated the city's speed. The great batteries of New York were at my command also; all their mighty heat-guns around the city's edge and around our electro-static tower and elsewhere were controlled by the distance-phone whose mouthpiece rose

before me. The great batteries of all our other cities were controlled in the same way by their own operators, and were subject like New York to the commands of the First Air Chief beside me, who could maneuver our whole great armada of tremendous cities at will through the air. In the city of San Francisco, too, we knew, was the Second Air Chief, placed there to take command in case New York were destroyed or the First Air Chief disabled.

Thus, on the morrow were grouped we three, who were to sway such colossal forces in a battle as no men had seen before. Now, Yarnall was pointing to the table-map's surface, where the red massed circles of the European and Asiatic Federation armadas were indicated but a few hundred miles on either side of our own great mass of cities. Watching them there, we sat in silence, save for the clicking of occasional switches by the engineers about us. From far away, far across New York and all the other air-cities gathered around it, there was coming the dull, dim throbbing of the life of millions that swarmed through those cities. And now Yarnall reached forward and touched the control of the great electrical periscopes whose screens boxed us in.

Instantly those dull glass screens were alive with light, and it was as though we were gazing forth from the very tip of the power-tower out over our gathered mass of cities. North and east and south and west, from all the screens about us the views were alike, of a tremendous mass of clustered metal towers that encircled New York. Below us was the screen, above which our metal seats were suspended on supports. It seemed a trap-door through which we were gazing down toward the green plains far beneath; though in reality all the city's massive base lay between us and that view. So intensely realistic was the scene that lay about us that we all but forgot the great circular room in which we really were, and seemed suspended high in air above the great mass of our gathered air-cities.

"The enemy armadas," said Yarnall, his voice low, "will be in sight within fifteen minutes."

For upon the map the two masses of red circles were rushing on from east and west, and seemed now almost upon the mass of circles that was our own great fleet of cities. Looking out over those cities, through the periscopic screens about us, we could see the forts raising their great guns to firing range. I realized, as I saw it, that the battle now ready to start would mean annihilation to half the world. This was indeed Armageddon, when on earth itself was left no human being at peace; when every nation was rushing through the air toward this last conflict!

Now, however, Yarnall touched another control, and from the electro-static tower's tip, high above us flashed great signals of brilliant lights that were taken up and repeated from all the power-towers of all the hundred cities that ringed us round. And, as those signals flashed, the great crowds that filled the streets of the air-cities were suddenly flowing out of those streets into the cities' towers; until within a few moments none were visible in all the streets and plazas, save those black-uniformed men who stood ready at the great heat-guns of our batteries. And those crowds went quietly, despite their tense excitement, because they knew that they were being ordered inside for their greater protection. There was no refuge upon the earth's surface far beneath, for them; when the destructive powers of all the world were battling above it in the air.

Then the First Air Chief spoke a brief order and, as Connell beside him repeated it swiftly into the distance-phone (as he did with Yarnall's orders in all the combat that followed) the great fleet of cruisers hanging above us and visible in our top screen divided into two masses, of a thousand or more ships each, which swept swiftly to east and west. Beyond the great ring of air-cities they leaped, until they were far out; and each division then formed into a great curving line screening our ring of cities to east and west, facing the fleets rushing toward them from those directions. Then we were gazing again at the table-map before us, a deathly silence seeming to grip all the world. Upon that map we could see the European and Asiatic armadas were now within hardly more than a hundred miles of our own; and tensely we watched the east and western screens now, gazing out beyond our cities.

"They'll use their cruiser-fleets for their first attack," Yarnall was saying as we gazed tensely forth. "They'll try to wipe out our cruisers before they bring their cities on to attack ours."

I nodded. "It would give them a big advantage when the cities come to blows. But our cruisers beat them back once with the odds two to one, and now—"

I broke off sharply, and at the same moment heard a low breath from Yarnall and Connell simultaneously, felt seemingly a low tremor that seemed to run instantaneously across all our massed air-cities. For there, far to the westward, black against the sky, there had appeared a line of far-flung black dots that were growing very quickly in size, and that were massed together in a crescent formation whose horns were toward us. It was the advancing cruiser-fleet of the Asiatic Federation forces. Tensely we watched it as it came on; then we looked to the east to see a similar crescent of advancing dots, the European cruiser fleet. On they came, smoothly rushing toward our own lines of cruisers, hanging to the east and west of our cities; and then for the moment we forgot them as we made out, to east and west, behind them, advancing toward us, great black masses that even at that distance seemed to fill the air. They were the two massed mighty armadas of the European and Asiatic Federation's air-cities, rushing to battle with our own!

CHAPTER X
The First Clash

FOR one moment we gazed toward them and toward the advancing cruisers that rushed before them, as though held by the grandeur of the spectacle. The tremendous mass of our air-cities hanging there, high above the earth the gleaming ranks of our own two thousand cruisers that poised to east and west, the advancing cruiser-fleets of twice their strength behind which there rushed gigantically on the great massed air-cities of our enemies—it was a spectacle breath-taking enough! But, then, the two enemy cruiser fleets had come within a short distance of our own waiting cruisers; and, as they did so, both their fleets shot suddenly upward, as though in answer to a common order, to drive above our own cruisers and our air-cities!

Instantly Yarnall had uttered a swift order; and as Connell's quick voice sent that order flying out to our cruiser-masses, they too whirled upward and forward to meet the onrushing enemy fleets. Then, far out in mid-air to east and west of us the great cruiser fleets had met, had smashed into each other with blind fury.

Through our screens we saw cruisers enveloped by scores in blinding flares, in that first moment of combat, as they raged in two separate mighty battles.

But, east and west, our own cruisers were outnumbered two to one and, despite their fierce resistance, were being pressed steadily back toward our gathered cities. Closer and closer through the air toward us were reeling those struggling lines of cruisers, more and more American ships falling in white-hot destruction as the heat-guns of their opponents concentrated upon them. Still far beyond them, to east and west, the colossal masses of the European and Asiatic air-cities were now rushing on toward us! Yarnall sent another order flying out, and the next moment a mass of cruisers that had remained at the edges of our gathered cities, on either side, and had not been in the first battle, were leaping forward now, like suddenly released hounds after prey. A score of them to the eastern combat and a score to the western one they flashed; and each, as it reached the lines of struggling ships, shot up over them and then flashed along their lines above them. And as they did, there shot downward from them over the battling cruisers intense jets of concentrated water vapor, which puffed out instantly into great white cloud masses that enveloped all the grappling thousands of ships!

Yarnall had brought into the battle, I saw, those great artificial cloud projectors that had saved us in our first great battle over the Atlantic! And, even as their white masses enveloped the struggling ships, he sent forth another order; and our own cruisers shot upward and downward out of those cloud-masses, at the very instant that they had been formed. Then, with all our own cruisers clear of the cloud-masses to east and west, and the European and Asiatic ships inside them driving for the moment in blind confusion, our cruisers poured a deadly hail of heat-shells down into the cloud-masses and the thousands of ships that swirled inside them! Only for a moment was it that they remained within the cloud-masses before fighting their way free; but in that moment they had been unable to fire a single effective shell at our own ships outside, and we had poured a veritable storm of deadly shells into the cloudy masses. So when, a moment later, the European and Asiatic ships broke from the vapor-clouds east and westward, our broadsides had taken toll of hundreds of their blinded ships, and hardly more than our own forces did they number now!

But, when they broke free from the cloud-masses and into open air again, they did not advance toward our awaiting ships; instead they shot back from either front toward their cities, in answer to some mysterious order. At once a similar order from Yarnall brought flashing back, to form again above our own cities, our own ships—still nearly two thousand strong and almost as many in number as the combined cruisers of our enemies. I heard dimly the great cheers that were rolling across all our cities, for this mighty blow which had beaten back our enemies' cruiser-fleets once more. Then those cheers died swiftly away; for, far away to east and west, the gigantic masses of the approaching air-cities loomed larger and larger, rushing through the air toward us!

Eastward the European Federation was approaching, in a gigantic circle that seemed to fill the whole eastern sky. To us three sitting there amid our periscopic screens, it was as though all the eastern screen was filled with that great oncoming mass of cities; Paris, London, Moscow, Cairo, Rome—all the tremendous air-cities of the great European Federation—and their capital of Berlin still at the center.

And westward, upon our western screen, loomed equally gigantic the similar circle of air-cities of the Asiatic Federation. Peking, the third in size of the world's air-capitals, at the center of its cluster of cities rushed at the same smooth speed toward us, with Shanghai and Tokio and Bombay and Rangoon foremost in its circle. From east and west thus the two stupendous circles of cities rushed toward our own, grimly waiting; and, as we watched them, there flashed over me in that tense moment a strange wonder as to the feelings with which one of a hundred years before would have watched this battle. Then I laid aside that passing wonder as the two great circles drew nearer to the range of our great heat-gun batteries. And this, surely, was a spectacle that none had ever seen or dreamed before—this spectacle of the world's mighty cities converging swiftly upon each other in battle to the death!

And as strange, too, must have been the sight of us three, sitting there amid our box-like periscopic screens, the heart of the mighty tower's base; yet seeing and directing from there all the great mass of the hundred mighty cities around us.

"They're not going to join forces!" I exclaimed: "They're going to strike us at the same moment from east and west!"

Yarnall nodded, his eyes intent upon the screens: "Either that," he said, "or—"

Armageddon!

HE broke off suddenly; for at that moment there came to us a giant salvo of thunder from both east and west, a terrific shock of sound that rolled deeply through the air toward us from the two distant armadas advancing! An instant later there was a whistling sound over our own cities, and we knew that a great storm of heat-shells was plunging toward them. A few struck with wild bursting flares across our massed cities, and with their suddenly-released gigantic heat there appeared great craters of fusing, melting metal. The greater part of the shells, though, fell short, whirled down to earth to flash on the ground far below. The range was not yet closed, I knew; and so far our own great cities remained silent as death. Yarnall was watching now with hands clenched tightly, as the two circles from east and west came on. A moment later there rolled from them another great salvo, and another mass of shells rushed toward us; but, though most of these also fell short, a greater number than before flared and fused in melting, searing death upon our own massed cities!

I gazed anxiously at Yarnall, a strange dread taking possession of me for an instant as the tremendous armadas came on. Would he never give the order to fire? He was sitting still as a carved statue, his eyes upon the screens and his lips compressed; and in that moment there came to me a dim sense of all the terrific responsibility that weighed upon him, the leader of a third of earth's cities and peoples battling against the remainder of mankind. Silent he sat and still, while the great approaching armadas rushed nearer, their cities coming more and more distinctly into view in our far-seeing screens. In another moment, I knew, another thunderous broadside would be belching toward us. But, just as I looked for it to come, Yarnall spoke a single word and, as Connell's swift voice sent that word flying out to all our cities, as my own flashed it to all the batteries of our centermost city of New York, there was a hush of a split-second. And then, out

from all our own hundred giant cities, there broke such a titanic thundering detonation as seemed to shake violently all the air about us! And, an instant later, we saw the heat-shells from our batteries falling in thousands upon the two advancing armadas, upon their rushing gigantic cities, and flaring into white-hot craters of fusing metal.

Before that terrific blow the two advancing masses seemed to stagger a little in mid-air, to hesitate for an instant; but then they advanced steadily onward and their own great batteries thundered an answer to our salvo. Then, as the two giant circles drew nearer to our own on either side, the whole world seemed swallowed again in one ceaseless thundering of sound. The giant batteries of all our great air-cities burst forth again, to send a storm of heat-shells rushing east and west upon our enemies! The air between us and the armadas nearing on either side must have been filled with shells in that moment; for we saw tremendous flares there in mid-air as shells of ours met some of theirs and burst. But few of them did that, most of them whirling through the air to burst and flare in all their awful destroying heat and brilliance upon the air-cities!

In that instant, as the batteries of all three gigantic armadas thundered, it seemed that numberless fountains of brilliant light and terrific heat were springing into being amid the metal towers of all the three masses of great air-cities! Great fountains of heat unthinkable, beneath which all the metal about them fused and melted instantly, and about which all life was scorched into annihilation! Yet this had taken but the first moment of the battle to accomplish; and now, as the two great circles of the European and Asiatic Federations swept nearer, I saw that two of the foremost of the great European cities, Paris and Lisbon, were staggering and reeling as they rushed forward with the rest! They had met an awful storm of striking heat-shells from our own cities; and though their great motors were deep in their mighty bases, though the alloy of their electrostatic towers could not be affected by heat-shells, yet the deadly hail of shells that had fallen upon them had penetrated apparently almost down to their great motors beneath!

I whirled to Yarnall, "Paris and Lisbon!" I cried: "They're falling behind the rest a little—they're hit hard!"

He nodded, eyes burning now: "All east batteries concentrate on Paris and Lisbon!" he ordered; and, as Connell's voice sent the order flying out to our eastern massed cities, their batteries were thundering with even greater fury.

But now all their shells were aimed toward the two crippled cities of Paris and Lisbon, and a hell of bursting shells were flaring across those two ill-fated giants of the air. It was as though a living wave, of brilliant heat and light from the bursting shells, were dancing like lightning across the two cities; and in that instant it must have burned from them all the life in their towers, even as they were striving to do with our own. The towers of each city became in that moment almost a single great surface of fusing, white-hot metal; its awfulness added to by the exploding of the stores of heat-shells and magazines beneath the terrific flares. Out beyond them and around them there swept other cities of the European armada to protect them. There came Madrid and London and Moscow, all their guns thundering answer; but now our own gunners were not to be denied of their prey. As our batteries sent repeated storms of shells upon the two doomed cities we saw Paris staggering, slipping to a lower level, hanging a moment there, and then whirling sidewise downward, down to the green earth far below! In a moment it had crashed, with a terrific rending and cracking of metal!

I heard a dull roar of cheers rolling across our city above and between the thunder of the guns, cheers that were redoubled a moment later as Lisbon too whirled downward to annihilation, a mere mass of fusing metal. But, even as the cheers sounded they were stilled, and Yarnall was uttering further orders to our batteries.

From the Asiatic Federation's circle, a great smothering fire of shells had been falling in those moments upon the westernmost of our own cities, upon Omaha. Its guns were still thundering in savage answer; but, battery by battery, they were going silent as there fell upon them the concentrated fire of the whole advancing Asiatic Federation cities, the great guns of Peking thundering at the center of the rest. Then Omaha, too, had slipped and staggered and was whirling down to earth in fusing destruction, its motors reached by the bursting shells at last!

Avoiding the Ambush

NOW it seemed as though in all the world was nothing but thundering guns and bursting shells; for now as they came nearer toward each other the three great circles of cities were exchanging a veritable tempest of heat-shells upon each other. Watching that hell of battle through our screens, we three sat tensely there. Yarnall's eyes were intent upon the advancing armadas; Connell, gripping his distance-phone, was barking orders to the great cities that were thundering about us. The two giant circles of the enemies' cities were very near our own now, rushing toward us at their tremendous speed; and, as they thus neared us, it seemed that nothing could surpass the tremendous roaring broadsides that were hurled from city to city. I saw Amsterdam and Madrid staggering a little behind their fellows, reeling beneath our awful fire, saw Hong-Kong in the Asiatic forces, its great towers all but evelled by the flaring heat-shells, plunge suddenly downward as more of those shells reached its motors! But in our own mass now New Orleans was plunging likewise beneath the fire of the advancing fleets; and St. Louis was swaying as though badly hit!

But at that moment there came an abrupt exclamation from Yarnall; and then we saw that the two advancing circles of the enemy cities, rushing toward our own, were changing their form, were changing swiftly into two great crescents of which the horns of each were toward us. Those two giant crescents were moving to join each other, to form one great circle; and, if they did so, our own mass of cities would be completely surrounded by the overwhelming numbers of our enemies, the easy target for all their mighty batteries. We would inevitably be annihilated by the enclosing circle of the enemy. But, even before I had understood that maneuver, Yarnall's swift order was flashing out to all our gathered cities.

"North at full speed for all cities! Unchanged formation!"

The next instant our whole great mass of cities was moving, was moving with swiftly mounting speed northward! For, as his order sounded I had jerked open the speed-control before me, had flung back one of the direction-levers. And, as I did so, there had come a great droning of motors from beneath, resounding even above the madly-thundering guns, flinging all the mighty city of New York northward. Also there came the

great hissing of the numberless new tube-propellers that were jerking it swiftly forward! And, as New York leaped northward at my touch, all its great batteries still detonating, so were all the great air-cities that ringed us leaping northward, and all their guns were still thundering toward the advancing armadas!

But now the enemy had seen our swift leap northward, and, as their commanders guessed our purpose, they sent their own two crescents whirling toward us with even greater speed to enclose us before we could escape! For the next moment it was a race between the three great city-masses, a race in which our own sought to evade the two that closed upon it from either side. And, as our cities and theirs raced through the air at tremendous speed, every gun still firing, it seemed that we must lose! For, just north of us, the two northward horns of the closing crescents had almost met, were almost joined before us! That northward horn of the Asiatic crescent held Shanghai and Colombo and Singapore and others; while the horn that projected from the European mass had foremost in it Moscow and Brussels and Algiers. And as we shot northward in that wild moment, to escape before those two horns could join, Yarnall sent flying forth a swift order for all batteries in all our cities to concentrate their fire now upon the foremost cities in the two closing horns to the north!

At once our own guns were thundering with redoubled fury; for, unless we could destroy in the next few minutes the foremost of those cities north of us, they would have closed upon us and brought our irretrievable doom. So, disregarding for the time all the other air-cities of the two closing crescents about us, all fire was concentrated upon the foremost cities of the two horns closing northward. A storm of heat-shells rushed thick through the air toward them; but at the same time the masses of European and Asiatic cities east and west of us were pouring down upon us the broadsides of their own giant batteries! And beneath that terrific fire, cities among our mass were falling swift in fusing destruction. St. Louis and Miami and Seattle were whirling to death as we raced onward; all the people in them who had been left alive by the shells were meeting annihilation in the great crash far below!

But, though we were being decimated by the fire of the closing crescents on either side, our own terrific concentrated fire was having effect upon the closing horns of cities north of us, and in the moments while we rushed toward them, Singapore, Colombo and Brussels had been sent down in white-hot destruction by our awful fire. The remaining cities in those two projecting horns were still rushing toward each other with their utmost speed to close the gap between them before our great circle could speed through it. With Moscow and Shanghai at their eastern and western tips, the two horns swiftly closed toward each other; while as swiftly and with every motor droning its loudest, with every heat-gun thundering northward, we shot onward. For a moment the whole great race was in doubt; for a moment it seemed to us that our great mass of cities could flash through that gap before it closed.

But as we watched in tense, terrible hope, even as our mighty cities raced northward, the cities of those closing horns seemed to make a last supreme effort, a last great burst of speed. They shot forward, their leaders Shanghai and Moscow almost racing into each other; and then, with all their tube-propellers reversed, they were suddenly halting a barrier of mighty air-cities all around us! But nothing now could halt our tremendous mass, so awful was our speed and so close were we to the enemy's line. I saw those cities looming suddenly gigantic before our own mass as we raced on; heard hoarse exclamations from Yarnall and Connell beside me; and then with a terrific shock, that seemed the shock of meeting worlds, our vast northward-flying mass of air-cities had crashed headlong into the great line of cities before us!

CHAPTER XI
City Against City

IN the moment that followed, after our flashing circle of cities had thundered headlong into the line before us, all other sounds, all the thunder of countless guns and the drone of motors and the hiss of tube-propellers and cries of voices, were drowned in one tremendous splintering crash of metal upon metal. The giant mass of cities about us seemed to reel drunkenly in mid-air in that moment. New York at their center staggered from the awful shock transmitted to it. Then upon the screen north of me, I saw titanic metal masses that had been cities falling downward. Moscow with Sydney and Algiers, and Boston with Detroit, these whirled downward in that moment—no longer recognizable as air-cities and seeming to the eye but great twisted bulks of rended metal.

But not even that giant collision had been able to halt the tremendous momentum of our northward-thundering mass of cities; for as those cities before us crashed downward, the whole great circle of our mass, New York still at its center, was thundering on through the gap that that crash had made in the line before us! We were sweeping northward and out beyond that line that our great crash had shattered. We had won free only by means of that awful crash. Instantly, Yarnall had cried another order, and our great mass of air-cities was swiftly shifting its formation into a long line; and at its head rushed our own city of New York. And then, while the great circle of the enemy's combined armada remained there for the moment still behind us, as though stunned by our colossal crash and escape through it, the First Air Chief sent another order flashing forth. At once our line turned like a wheeling snake, high in the air, and was rushing back upon the circle of our enemies! We were rushing back and along the line of European Federation cities that made up that circle's eastern half for the moment. And, as our long line of mighty cities whirled past them, all our batteries were thundering upon them roaring death.

The advantage now was all with us; since in their great circular formation more than half their great mass of cities could not reach us with their guns. And, so during that moment, the odds were more than even as our long line swept on, with all our batteries pouring their broadsides forth! Steady at the controls, I held New York at that colossal line's head, holding it at an even distance from the great circle of the enemy cities. I saw now that our terrific fire, as we rushed past those cities, was swiftly in that moment taking effect upon them. Even as I gazed, Amsterdam, Vienna, Cairo and Madrid were falling beneath the awful concentrated fire of our rushing cities; and in our own line Buenos Aires staggered, swayed and fell as the enemy barked savagely back toward us.

"On!" Yarnall was crying beside me: "It's our chance to strike hard at them—before they can bring the rest of their cities into action!"

"But they're doing it now!" I shouted back to him,

above the thunder of guns, the drone of motors and hissing tube-propellers. "They're stringing their circle out into a line also!"

For it was plainly visible, upon the great screen beside me, that the commanders of the enemy were striving to form their great circle into a line that could meet our own more effectively in mid-air. We saw their cities rushing inward and changing formation there beside us; but we knew that our change had come and so hung upon the flank of the great mass of cities, our line rushing along it with all our guns turned toward it. And now, though Quebec was falling in our line, our guns had sent down Copenhagen, Yokohama and Calcutta in the mass beside us; since by now we had raced past the mass of the European air-cities and our guns were thundering against the Asiatic cities. Their guns roared sullenly in answer to us as we flashed past them; but, for the moment, in their disorganization, in their attempts to reform swiftly from their circle into a line like our own, their fire was seriously hampered by their own movements. In that moment we were pouring a smothering hail of shells upon them, and city upon city was whirling downward in wild destruction.

Then suddenly, with a supremely swift effort, their circle had lengthened, straightened, their confusion of the moment had vanished; and their cities had formed almost instantly into a long line, like our own, but longer than our own. We found ourselves in that moment with our own line parallel in mid-air to theirs, a mixture of European and Asiatic cities directly opposite us; and then, as we raced on, they were racing on with us, their own batteries thundering with newly-released fury, as they sought to blast us from the air beside them! I heard the sharp order of the First Air Chief beside me, and held New York steady at the head of our line. The two great city-fleets were racing through the air in a great running fight, with every gun thundering!

Directly opposite New York there raced, at the head of their line, the mighty air-city of Peking, third of the three great air-capitals. The two giants were evenly matched; and now at the head of our respective lines we engaged in a tremendous duel in mid-air, a duel so intense that, almost, I forgot the fate of the rushing armadas behind us. In all New York about us mighty fountains of brilliant light and awful heat, were flaring with each salvo of heat-shells from the Asiatic capital. But, at the same time, our own gunners were working their batteries like madmen; and we could see similar giant craters of fusing metal springing into being over all the vast mass of clustered towers that was Peking. Far behind in the enemy's line raced the third great air-capital of Berlin; and we guessed that it was now from Berlin that the movements of all our foes were being directed. But so awful was the battle that we were undergoing with the Asiatic capital opposite us that for the moment we forgot almost all else.

Behind us, I was dimly aware of all our great line of air-cities grappling with the line rushing opposite; Chicago, a little farther back in our line from ourselves, was carrying on as terrific a duel with London. Constantinople in the enemy's line was whirling downward beneath the batteries of Denver and Valparaiso. Montreal, in our own, was falling in fusing death as it became the target for all the giant batteries of the colossal city of Berlin. City after city in the two racing, struggling lines was falling to annihilation as the awful battle raged on. High above the colossal lines of racing cities, our own great fleet of cruisers and the enemy's were whirling in a wild fury, insane as our own giant battle of cities. Surely Armageddon had come upon the earth at last!

Although the European and Asiatic cities still outnumbered us, we had cut down their great margin of superiority in that attack which our line had made upon their confused circle. Now, with equal fury, they were striking from line to line.

Straight ahead of our two racing lines, there loomed now a great bank of drifting vapors, great cloud-masses drifting south from the lakes to the north. Neither of our two battling lines desired to enter those vapor-masses, and so as one, when we neared them, both lines shot downward.

Surrounded Again

DOWN—down—with our batteries thundering still across the gulf toward Peking, whose own guns answered with as great a fury, though in their city as in ours, battery after battery was being silenced! Down—down—until the green earth beneath, lit by the descending afternoon sun, seemed just beneath us, rushing up toward us with awful speed as we shot down to it! Yet in that dread moment neither line of struggling cities straightened upward, each fearful of the other's gaining an advantage. In an instant more, it seemed, New York must crash together headlong into the earth.

Downward we shot, and I saw the green plain looming awful beneath us. At the last moment I jerked back another of the direction-levers before me; and as, in answer to the controls, New York tipped sharply upward once more. I saw Peking opposite rushing up at the same instant, saving itself as we had done. Behind us the cities that directly followed in our two lines were curving up as swiftly, all their guns thundering still as furiously. But, farther back in the two lines, there were cities that had swooped too low to recover, had dipped lower and in the next moment had crashed and been annihilated upon the green earth, as they collided with it at their terrific speed!

But while our two lines were whirling upward at as steep a slant as they had descended, the battle seemed to deepen in furious intensity. New York and Peking were stabbing still at each other with all their forces, each colossal city seeming too mighty to be struck down, though each was flaming under a terrible fire of shells. Behind us, after a running duel that had achieved almost the magnitude and fully the intensity of our own, Chicago had given London the finishing stroke; and that great city was wavering, staggering, then slipping and falling in white-hot annihilation toward the earth! And, as all along both lines, other cities staggered and fell, I saw that above us the two whirling cruiser-fleets had almost entirely vanished. They had almost entirely annihilated each other by the insane fury of their attacks!

I felt my brain spinning, felt all things about me resolving into a wild whirl of thunderous sound and flaring light. I heard, as though from a great distance the orders of Yarnall beside me, and the frenzied voice of Connell sending those orders flashing out from the distance-phone; heard the thunder of guns and sound of motors and propellers and wild noises that were coming from all the city about us. Then, before our two onrushing lines, there loomed another great mass of drifting vapors; and again our two lines dipped downward to avoid those masses. But, as we shot downward, the line opposite us with Peking at its head shot as quickly upward again, in answer to some com-

mand; it raced on *through* the vapor-masses instead of beneath them!

In the next moment we had shot our own line upward again to race side by side with them still; but we were too late, for that moment had given them, at their tremendous speed, the advantage for which they sought. For in that moment, rushing on through the vapor-masses instead of beneath them, they had gained a little; so that when we shot upward again to their level they were ahead of us as well as beside us! And then their line ahead of us was swiftly curving back and around our other side! As we slowed instantly, to avoid a collision that would annihilate us and all our mass, they swept the end of their longer line around the rear of our own, and thus in the next instant were forming a complete circle around our cities. They had at last accomplished their great object, had managed to surround our mass of mighty cities, outnumbering us still.

As their circle closed lightning-like about us, we three sat in that moment as though stunned; and then, from all the air-cities that encircled us, a terrific thunderous fire was pouring upon us! Encircled, we were a perfect target now for all the European and Asiatic gunners around us, pouring all their mighty broadsides upon us. And now Yarnall had leaped to his feet, the tense agony in his eyes reflected in those of Connell and myself in that terrible moment.

"They've got us!" he was crying hoarsely: "They've got us inside their circle at last—they're hammering us to doom!"

"Can't we break out?" I cried: "Break through this circle about us?"

He shook his head, his eyes burning: "No—their circle is complete around us now and we'd only crash our own cities to earth—but we'll try above and below!"

With the words, he gave a brief order and, as Connell's voice flashed that order to all our confused mass of cities, they leaped upward in sudden concerted motion, all their motors' energy turned suddenly into their vertical lifting power. But, as they shot upward thus, to win free of the circle about us, that circle lifted at the same speed as our own mass, hovering still around us and beating us still with all the relentless fire of their massed batteries. And, when we shot suddenly downward in an attempt to escape from below they sank downward at as quick a speed, were encircling us still. And now, beneath that awful hammering fire of all the massed cities that enclosed us, our own were beginning to stagger; to sway and reel!

The titanic circle of enemy air-cities about us and our own great throng of cities, each a giant circular mass of belching flame, floating there miles above the earth; the thunder of each city's giant batteries, and the terrific brilliance of the storms of heat-shells that struck from city to city; the great glowing craters of metal that each striking shell made in a city, all these things seemed merged in the six periscopic screens that enclosed us like some chaotic and meaningless panorama!

I was aware of Yarnall's agonized expression, as we strove with every power that was ours to save our great air-cities from destruction. For now in our cluster, city after city was falling beneath that deadly fire of fusing shells. Los Angeles, Winnipeg, Panama, and Nashville whirled down one after the other. And, though our batteries were still thundering their roaring answers, our surrounded cities were still striking savagely out, with the colossal batteries of New York still thundering loudest, I saw how swiftly we were being annihilated! For, raging there in fearful battle high in the dusk between earth and stars, there was left now hardly more than sixty of our hundred air-cities; while in the circle about us there still hung, despite the giant blows we had struck them, a hundred or more of the European and Asiatic cities! And with all their guns thundering into us, the odds were swiftly changing and becoming more in their favor!

Finally I stood up, as though jerked to my feet by some strange force greater than myself, and wheeled toward the First Air Chief.

"It's the end now, Yarnall!" I cried to him above that thunderous roar of battle that seemed splitting all the night about us: "The end for all our cities within an hour if this keeps on!"

"The end!" he said, his own face grim: "But there's no escape—we can only meet it fighting!"

My eyes held his fixedly in that tense moment. "The hundred cruisers in the plaza outside!" I said: "The cruisers I had you keep waiting for me—that last crazy plan of mine is our one chance now!"

"Your plan?" he cried, a flicker of hope rising into his eyes. But when I explained that plan in a few swift words his eyes widened with sudden stunned astonishment, and he cried out: "The thing's insane, Brant! You'll never make it!"

"But it's our last chance!" I shouted to him as the thunderous drumming of doom all about us deepened, and two more of our cities crashed earthward. "It's the one last chance to save our cities!"

He paused there silent a second, then reached, wrung my hand tightly. "Then go, Brant!" he said simply: "Take the hundred cruisers—and God grant that you are able to do the thing!"

I shouted to the black-jacketed attendants who were working like madmen around the great room's instrument-panels, cutting out motors that the heat reached, switching in spare motors and tube-propellers, keeping the mighty sustaining power of New York steady. Two of them leaped swiftly at my call, to the side of Yarnall to take the places of Connell and myself. And then Macklin and Hilliard who had been working with them, were running toward us also, and we four were running across the room and through the ante-rooms until we issued out from the electrostatic tower's base into the great plaza.

Standing there in that plaza with the darkness gathering about us, there stretched from horizon to horizon a boundless mass of gigantic light-gemmed cities, our own and the titanic ring that encircled us. The myriad lights of those cities, though, by which their gun-crews worked the great batteries, were feeble in comparison to the tremendous and blinding flares of brilliance in all directions that were fountaining up in giant gouts of dazzling light. Across all those cities floating, there leaped and flew the heat-shell flares, and the thunder of the guns was deafening, titanic, like the thunder of a stream of falling worlds! Beneath that thunder there came to us thin, high cries, the wild cries of crowds in the towers of cities and in their streets and plazas. And high, high above all these, far, far overhead, began to gleam the pale mocking eyes of the distant, watching stars.

All about us, in that moment that we burst out onto the plaza, it seemed that heat-shells were striking and flaring. But the static-tower itself was of a composition that the shells could not harm, the rare refractory alloy that in air-cities is used only for the vital power-towers. And, though shells had struck here and there at the plaza's edge and on its surface, though there were on it and around it still-glowing craters of fusing

metal, few of the hundred close-massed cruisers that waited with their crews upon it had suffered serious injury in the awful course of the battle so far. And now Macklin and Connell and Hilliard and I were racing across the plaza toward those cruisers, into the foremost of them and up to its bridge-room. Then Macklin jumped to the controls, as I called an order into the distance-phone over the titanic drumming of guns. In the next moment our hundred cruisers were driving up like mad things above the titanic battle raging there above.

Up—up—through a wild inferno of rushing shells, up over all the struggling, thundering, reeling cities we sped, on the wild venture that was our last wild chance. As we drove upward, I now saw others of our central mass of air-cities falling. Atlanta and Cleveland and Mexico City were whirling downward, giant masses of lights in which glowed countless great fusing craters of metal, gyrating insanely down through the darkness to crash in awful destruction on the surface of the affrighted earth far below! Hardly more than a half-hundred, indeed, remained of all our air-cities now; and the odds against them swiftly lengthened, as they were hammered still upon an anvil of fire and death by the circle that hemmed them in. They were staggering ever swifter, were reeling and swaying so that within a few minutes, even as I had said, the remorseless fire from all about them would send them to earth also, and wipe the last of the cities and peoples of the American Federation from above the earth!

But, as I saw that, our own cruisers were whirling on above that giant central mass, toward the great ring of enemy cities about them. Macklin at the controls, with teeth set, sent our ship and those behind it driving low above the awful combat with the storms of rushing shells from both sides thick about us. Ship after ship behind us was flaring and fusing and falling in white-glowing meteoric destruction, unnoticed and unheeded by any in the titanic thundering battle beneath! On—on—we sped, rocketing through the night; seemingly the only cruisers now in the air, since the two great fleets had all but annihilated themselves. Yet as we shot on, it seemed almost that no cruisers could exist in the air over that great battle; since in dozens, in scores, our own ships were falling, stricken by the tempests of shells through which we were rushing!

But now we were reaching our goal, the giant Berlin that hung there in the enemy's circle with all its mighty batteries thundering again our doomed cities. Down toward it our cruisers swiftly rushed, unseen by any in the wild confusion that swept that city below us; down until we saw plainly the terrific spectacle of thundering batteries and wildly-rushing men. Here and there were heat-shells bursting and flaring in dazzling death, as the guns of our own cities roared savage answer. Down toward it moved our ships, now hardly more than a score in number, until there loomed just beneath us, that mighty central static-tower in which we had been so recently imprisoned! As we shot down toward it I beheld a glass ball above its tip, recognized that as similar in purpose to the periscopic-screens on our own tower's tip, and then we had shot down past it, until our score of cruisers hoved beside the great tower's side, at the fifth level.

Hovering there in that moment beside the tower, with all the wild confusion raging beneath, and the plaza below still empty, we were still unseen by any beneath, by any in the great batteries that were thundering all around that plaza. Poised there in the darkness, we could see that the windows beside us were bright-lighted; that guards were swarming in the static-tower's upper levels, rushing to and fro. Then as our cruiser's door swung open, just level with a window beside us, Macklin and Connell and Hilliard and I were springing forth from that door and across the narrow gap, through that window, our heat-pistols ready in our hands! And at the same moment there burst after us our crew, and from all the windows around that level, from all the cruisers hovering beside those windows, a stream of black-uniformed Americans with heat-pistols in hands were pouring into the tower's fifth level!

Instantly the guards in that level were snapping their own weapons up toward us; but before they could fire a score of cartridges from our pistols had flicked and flared among them. As they sank lifeless in scorched, burned heaps of flesh we were racing through the other rooms and corridors of that level, killing the guards in it with our heat-pistols, the surprise of our attack taking them unawares. So awful was the drumming of the titanic battle all around and outside, that no alarm of our presence penetrated to the levels above and below us, and, now with the last of the guards wiped from that fifth level, I turned toward my three companions.

"Connell and Hilliard! Take half our men and find your places here in the tower, keeping anyone in its upper levels from getting farther down than this! Macklin, watch with our cruisers outside—at this low height the batteries around the plaza can't reach the ships, can't pivot toward you—and be ready to keep anyone from getting into the tower from outside!"

As they whirled to obey my orders with the other half of our men, some hundred and fifty in number, I was running toward the cage-lifts. With swift blows we destroyed the controls that guided them from level to level of the tower, and then we rushed toward the narrow stairs that led also downward. Another moment and we were rushing down those stairs, while as we did so there came a scuffle of battle above us, and we knew that the alarm had penetrated to the upper floors of the tower and that the guards there were pouring down to battle with Connell and Hilliard and their men. We leaped on downward, though, down until we had burst down into the fourth level. There our surprise was as complete, and before the guards there were aware of our presence, almost, we had sent our heat-cartridges flaring among them, had swept them from existence and were leaping down to the third level. And in that it went the same; and in the second below it, and then, with hearts pounding, we were rushing down into the first level!

As we poured down into its anterooms, its guards rushed toward us and their own heat-pistols came up; but they too were falling in scorched heaps a moment later, and we were dashing through the anterooms toward the great circular inmost chamber that held the inmost controls of this great air-city of Berlin! Through those anterooms we burst, the surprised guards falling lifeless and burnt before us, and then into the inmost circular room! All around its panelled walls moved green-uniformed attendants who whirled with surprise from their switches and dials at our entrance; while at the room's center there was what seemed at first to be a great dull-glass globe! We knew that that globe enclosed within itself the great table-map and controls of Berlin; and now there were bursting out, through an opening in that globe, the three green-uniformed men who had been within it—the First Air Chief of the European Federation and the two officers

who with him had been controlling the movements of all the mighty combined European and Asiatic cities!

The Captured City

AS the leader saw me, his swarthy face lit for a moment with a flash of recognition, of astonishment; and then he and his fellows were leaping toward us, their hands flashing down toward the heat-pistols at their belts as the attendants around the room jerked forth their weapons also. But as they did so, our own heat-pistols flashed up and for the next instant the great room seemed full of flares of blinding light as the cartridges burst among them, sending them staggering and swaying and falling in seared heaps! I shouted to my men swift orders that sent a score of them to the great switch-panels to take the places of the attendants there; while the remainder rushed toward the great doors that opened from the tower's lowest level into the plaza outside. Swiftly they closed those doors, barred them and massed behind them, and then I was rushing toward the great dull-glass ball at the room's center.

Inside that ball stood the great table-map upon its great block, while beside it were the six levers and speed-knob which controlled the speed and direction of Berlin. As I took the seat before them now, I gazed about me, and saw that the great ball's interior was in effect a great periscopic screen itself, one in which I could gaze in any direction through the other great ball above the static-tower's tip. And now, gazing into it around me there, I could see that in the outer night there stretched still the giant ring of the enemy cities, of which this Berlin was the heart, surrounding our own survivors and hammering them still with that deadly fire which would soon bring them crashing to earth. Far out over that mighty field of battle, its brilliant lights and blinding heat-flares stabbing the darkness, and its thunderous roar of guns shaking the air, I could gaze; while even at the same moment I heard, high above, Connell and Hilliard and their men engaged fiercely in holding the guards in the upper tower back. At the same instant came a sudden knocking, an alarmed rapping and then a battering and crying of voices against the great tower's door from outside; as the alarm spread from the tower's upper levels!

Disregarding all these things, I grasped the controls before me, watching the scene all about the great city through the periscopic ball about me. Swiftly I jerked open the speed-knob, at the same time slamming down one of the direction-levers; and, as I did so, I saw that the whole great city of Berlin was soaring up now above the ring of cities in which it had hovered, until it was a little above their level. And then I thrust back the lever in my hand and jerked down another; as I did so the mighty air-city of Berlin, the titanic air-capital whose controls we had captured and which lay now in my hands, was driving sidewise toward Geneva, that hung beside it in the ring. Toward it we sped, driving at top speed toward it at a height a little above it, so that our colossal base was on the level of Geneva's upper towers. And with set teeth I drove Berlin onward, and in the next moment its great base had sheared right across the upper towers of Geneva, had mowed down those great towers like blades of wheat before a reaper!

Then as Berlin drove on from above it I saw Geneva wavering in mid-air behind us for a moment, and then crashing down to earth through the night! I had mowed away the great electro-static tower whose collection of cosmic energy held it aloft, and Geneva went crashing down to earth through the darkness like some giant comet of blazing lights plunging to doom! And then, beneath my hands, Berlin was driving still onward across and over that great ring of enemy cities, shearing now in the same way across the towers of city upon city in that ring. Stockholm and Cape Town and Bucharest fell as I mowed their power-towers from them; and to them that awful spectacle of Berlin rushing upon them and sending them to doom, crashing across their great towers, must have been utterly stunning and inexplicable in that wild moment!

On—on—around the great ring I held, almost insane with wild fury and excitement in that moment of triumph, driving through the night on our captured air-city and sending city after city whirling to death. I was dimly aware that the fighting above had ceased. Connell and Hilliard and their men had wiped out the guards in the tower above, and they had rushed down to defend the electro-static tower's doors, against which a wild battering was resounding now. Huge crowds were surging madly against the tower as they felt their great city rushing through the night and crashing in wild destruction across their fellow-cities! But, in the wild excitement that was surging through me now I paid no attention to all about me; for surely I was swaying such colossal forces as no man ever had swayed before.

The European and the Asiatic cities were breaking from me, in wild panic, disorganized and shattered; since there came now no commands to them from this city of Berlin that had held their commander. And as they broke into a disorganized mass, the half-hundred American cities massed in the center, who had seen the terrible havoc that Berlin, beneath my hands, was wreaking upon their enemies, were themselves rushing to the attack once more; and all their guns were thundering toward the disorganized mass of their enemies!

Up toward Berlin from that mass as we rushed forward there rose to meet us the giant air-capital of Peking, battered, scarred; its commander seeking to stay this crazy destruction its sister-capital was wreaking upon their own forces. Up it came; and for an instant it seemed that Berlin and Peking must crash together bodily, but with a last wrench of the speed-control I sent Berlin racing higher. And then, as we met Peking, crashed over it, that mighty capital's power-tower also, with its other clustered towers, was sheared from it by our great base. Peking was wavering for a moment and then went whirling down to death! Yet even as it wavered, slipped and fell, its great guns were thundering savagely upon us until it had crashed to earth far below!

Victory!

AND now, down through the night upon the mass of our enemy cities, I sent Berlin slanting down toward them, at its full speed, and across them in a tremendous ramming swoop that sheared the towers from a dozen of them, even as they attempted confusedly to rise and meet the onthundering mighty city! Of that confused, disorganized and broken mass there remained of them at last hardly more than a score, still savagely belching death from their guns toward our half-hundred American cities and still sending an occasional one downward! But now as I whirled the giant mass of Berlin back toward them like a striking, gigantic bird of prey, I was aware of a tremendous battering and clanging of metal; and at the same moment Hilliard was shouting to me from the great doors that opened from

the anterooms into the plaza.

"They're breaking down the doors, Brant!" he was screaming above the wild thunder of battle and the clamor of giant crowds that surged against those doors outside: "Fight on, though—we'll try to hold them back!"

"Hold them a moment longer!" I yelled back to him: "A moment more—!"

For now I sent Berlin whirling downward in another terrific swoop across the mass of our enemy cities and it sheared across half their mass, as they sought by rising or sinking to avoid that deadly swoop. But a half-score were left of them now, and now the half-hundred cities of the American Federation had gathered about them and were hammering them with terrific fire. No gun sounded now on Berlin, all its crews and soldiers were rushing wildly across it toward the electrostatic tower, as the city whirled and crashed and fought and ran there against their own allied cities! Caught in the terrific fire of the cities around them, the half-score European and Asiatic cities were going down with guns thundering into annihilation. But now I was aware at the same moment of a terrific uproar there at the tower's doors and of wild shouts and clanging blows there as our men fought to hold back the madly surging crowds outside!

Gripping the levers before me for one last effort, I jerked open the speed-control to its widest; and then, as it shot above the mass of the European and Asiatic cities, only a half-dozen in number now, I whirled the mighty mass of Berlin down upon them in one last tremendous swoop from which they sought in vain to swerve. They too were hesitating for a moment and then went whirling down to death, the last of the European and Asiatic cities save for Berlin itself about me! And then, as I brought that city to a stay, with the last of its companions crashing beneath and with the American cities hanging all about us now, there was a great clang of falling metal at the tower's doors, and back through them wild crowds without were pushing our black-uniformed defenders!

Connell and Hilliard at their head, our men were being pushed back through the ante-rooms, back toward the great circular room in which I sat at the controls; and, as I gazed out through the opening in the great periscope ball about me, I saw that an instant more would see them overpowering the last of our men, rushing in upon me to take the city's controls once more! But as I saw that, I reached forward, slammed down the lever that sent the city rushing downward! I gripped that lever and with a supreme effort tore it completely from its socket! The next moment a wilder cry came from the crowds fighting through the door and the crowds over all the city outside, as they felt that city whirling and swaying beneath them, felt it whirling down to death through the night to annihilation!

And as they uttered that tremendous cry, as the swaying city flashed downward, their struggle at the door forgotten in that awful moment of doom, I was aware subconsciously that I was staggering with Connell and Hilliard and our remaining men, up the narrow stair. Up to the great tower's second level and to its windows, beside which hung our cruisers with Macklin and a skeleton crew, holding them there beside the tower even as the great city whirled with awful speed downward! Then we jumped through those windows into the cruisers. And the next moment, just as the cruisers with ourselves inside them drove upward like light from the falling city, Berlin had crashed into the earth just beneath us, with a terrific, annihilating shock that buckled it, broke it, made of it but a great twisted mass of rended metal!

Then we were driving up toward the half-hundred remaining American air-cities that hung still high above, the giant city of New York still at their center. Up until we had soared above those cities and they lay beneath us, giant circles of brilliant light, scarred here and there with countless craters of fused metal! Their great crowds of peoples had surged, now, from their towers, out into their squares and streets. They gazed as if incredulously stunned by their deliverance, at the empty air and night about them, where so shortly before had hung the enemy that had been sending them to doom. In that moment, as we hung there high over them, in that moment of incredible surprise and dawning joy, it seemed that all the world was silent after the terrific thunder of that wild rushing battle that had riven earth and sky so short a time before. It was as though the night, and the winds about us, and the white stars overhead, were as silent with astonishment in that moment as the crowds on the cities that hung around and beneath us.

Then suddenly, from those cities, there was coming up toward us as though from a single voice a single, mighty cry!

Downward

AT dawn of the next day our half-hundred great air-cities prepared to separate, to move back to those positions that had been theirs before danger had brought them together. Through all of that night they had hung there together, their streets crowded with weeping yet rejoicing crowds; and, now that the dawn showed them the green plains far beneath, they were beginning to depart. And we five, sitting there within the periscopic screens in the power-tower of New York, were watching them as they prepared to go.

Battered and scarred, all of them, by that titanic battle through which all had fought, many of them with great towers fused and broken, and scarred with great craters, they were crowding toward us. Washington was foremost among them, until it hung just beside our city, its great streets and plazas thronged with shouting crowds. And, in the wild shouts of those crowds, we could hear our own names, their roaring tribute. For, in their eyes, we had saved them by that last wild effort of ours. And then Washington was moving away from us, toward the southeast, speeding away and vanishing as a dark spot in the southeastern sky.

And now another was crowding beside us, and another, and still they came. Pittsburgh and Guatemala, Tacoma, Chicago and Philadelphia, Rio de Janeiro, Kansas City and Vancouver—one by one they were driving beside us, their giant bulks hanging beside New York, their mighty cheers reaching us. They moved away to north and south and east and west, to vanish as dark, dwindling spots in the skies, until New York alone of them remained hovering there high above the earth. And then, Yarnall's eyes returned to the screen beneath us, where there were revealed the great, shattered wrecks, laying half-buried in the green earth far below.

"We win," he said, slowly: "The American Federation wins; but at what cost? Two-thirds of the world's cities have crashed to annihilation and death, and a half of our own."

."It's so, Yarnall," I said, gazing down with him: "yet it was our necessity, and not our will. They at-

tacked us without warning; attacked us with mighty weapons which they had devised especially to annihilate us all—and we could but defend ourselves."

"I know it, Brant," he said: "We could do nothing else—but I am glad—glad, man!—only that this greatest of all wars is the last."

"Earth's Last Air War!" It was Macklin speaking, thoughtfully: "Now, the war lords of our enemies have gone, their people will join with us to end all wars, to forget all our enmities. . . ."

"We will," I said, as I turned toward the controls, "but we five can never forget what has happened."

And then, as the others sat silent at my words, I was opening the speed-control before me, moving over one of the great levers, and sending New York, with its great motors droning and its tube-propellers hissing, away to the east; toward the sunrise, faster and faster, rushing eastward over the green plains that were now rolling swiftly back far beneath. On all the mighty city around us, in all its streets and plazas, its great surging crowds were shouting still, a great, rejoicing clamor. But we five there at the city's controls, in the great tower, sat silent and unmoving. Gazing out into the blue cloudless heavens before us as our city rushed dawnward, we looked into the face of the morning sun. It was the sun rising on a world at peace.

THE END

The Greatest Interplanetarian Story of All Time

is to our minds

"THE SHOT INTO INFINITY"

By Otto Willi Gail

During the past few years, the Germans have progressed rapidly in serious attempts to solve interplanetarian travel. In the present story by one of the greatest German science fiction authors, Mr. Otto Willi Gail has given the world a real story on interplanetarian travel, not based upon the usual fiction, but upon real science.

In writing the story he has had the collaboration of the most famous German scientists—experts on the subject. A most marvelous story, which will be a classic for all times, is the result. At least 60 to 70 per cent. of the material contained in this story has never appeared in print before in any other science fiction interplanetarian story.

This story along with many other superb ones appears in the new SCIENCE WONDER QUARTERLY.

See the important advertisement on page 570 of this issue.

Watch the Newsstands for the

GOLD COVER

Flight of the Eastern Star

(*Continued from page* 507)

in the way of tense, gripping thrills in the form of near catastrophes and mid-air rescues, although I enjoyed every moment of it. And it was with pleasant memories that I finally entered again the office of my friend Jackson Worthington in Los Angeles. He was as pleased to see me again as I to see him. He at once informed me that I had "promenaded some of my paunch" away, and that I looked as fit as the proverbial fiddle.

"By the way, Jack," I said during the course of our discussion, "did Captain Markson deliver the consignment in Peiping on time?"

Jack laughed pleasantly.

"Certainly, Tom," he said: "He piloted the *Eastern Star* himself all the way from Tokio to Peiping and arrived well ahead of schedule. He held up the ship an hour, and with Madden saw personally to the delivery. But somehow, reports had reached China's underworld that a consignment of bullion would be delivered to the government at that hour; and Madden and Markson had one helluva time. They were raided shortly after they departed from the anchoring tower in a machine; but leave it to Madden to fight his way clear! He got a dirk thrust in the arm and a bullet crease across his neck; but they delivered the goods nevertheless!"

"Damn it!" I exploded: "And I had to miss all that just to watch a few crazy Japs showing off in airplanes! Markson wasn't hurt, then?"

"No," Jack replied: "Markson is the luckiest fellow I ever knew! He has had a lot of ups-and-downs, but I've never known him to get up too high or down too low! He's immune to danger either personal or public! As for Madden, he's too modest to tell anyone how he got his neck in a sling. What a corking good halfback he'd have made on our old Bingham team, Tom!"

"Madden?" I said: "Why, Jack, what he couldn't do to those Gayle men physically would have been made up by one look at him. When he scowls the world ought to tremble in fright! But let me tell you, he's a he-man to the core—and one of the finest, despite his looks!"

"Yep! But our new globe-circumnavigator, the *Comet*, is going to part Markson and Madden. Madden has been elevated to a captaincy and will command the *Eastern Star*. The *Comet* is designed to be the finest ship ever built, and will slice eight hours off our usual 'round-the-world time. You ought to book passage on her now, Tom! With Markson in command of such a ship, you're bound to see some excitement!"

"Maybe I will, Jack! Maybe I will!"

And with that we parted.

THE END.

TO LOVERS OF THE BEST THAT THERE IS IN SCIENCE FICTION

If you are a lover of science fiction you must certainly read the December issue of SCIENCE WONDER STORIES, sister magazine to AIR WONDER STORIES. Here you will read in most thrilling stories the future of the world—stories of future civilization, travels to other planets, stories of biology, medicine, chemistry.

Contents of the December Issue

THE CONQUERORS
By DR. DAVID H. KELLER

THE SUPER VELOCITOR
By S. C. CARPENTER

THE LOST MARTIAN
By HENRY HARBERS

THE TIME OSCILLATOR
By HENRY F. KIRKHAM

And other stories, as well as Interesting and Educational Features, Science News, Science Questions and Answers, Letters from Readers

The Phantom of Galon

(*Continued from page* 517)

"You know the rest of the story. When I saw your static supercharger, I knew that my days were numbered; so I persuaded you to go to Europe with a purpose to kill you on the way. But my good instincts had not been completely submerged; I could not kill the boy that I had dandled on my knee. When I saw that you were falling in love with Miss Huntington, I became intensely jealous of her, for she might take you from me. The 'fiend' who had plotted your death now wished to preserve you for himself. I decided to kidnap her without delay. But in doing so, for the first time in my criminal life, my plans were upset; and I barely escaped with a whole skin, thanks to you. Later, however, I successfully accomplished the abduction of your bride and her servant."

"Did you kill her, too?" broke in Manning at this point. He waited, dreading the answer which would verify the death of the one he loved. There was a breathless pause, then Herrick spoke again:

"No, I did not kill her. I intended to do so; but something has stayed me."

The sudden relief was too much for Manning. He broke down and cried like a child.

While Manning was getting his emotions under control, Herrick spoke some strange words to the Malay, who immediately left the room.

"The body which you thought was mine," Herrick continued, "and which lies buried back home, was specially prepared by me for the purpose. It was my wish that Richard Herrick should drop forever from the sight of the world. Just a week ago the demon that had so long dominated my mind, suddenly left me for a time. I realized with horror what I had done. Then came your pursuit; I tried to stop you by paralyzing your motors, but I did not wish to harm you. I wanted only to escape. I have decided to give up, confess everything, and send you home with your bride."

"But what will become of you?" broke in Manning.

Herrick laughed coldly:

"My doom is sealed. The demon has gone for a time only; I am a sane man now; but I cannot tell how long that will last. If the devil again possessed me, I would become a raging maniac; but that shall never be. Five minutes after you leave this ship, I will die and my secret will go with me. No trace of this satanic invention shall remain. I have had myself bound to my chair, lest the fit return on me before you escape."

A door opened on the far side of the room and the huge Malay entered, followed by Margaret Huntington!

"Dick!" she cried, and ran into his arms.

When the reunited lovers at last turned from each other and looked questioningly to the master of the *Phantom*, the latter said:

"You two must go now, and you will never again return to Galon. I wish you all the happiness in the world. You must try to forget Richard Herrick."

There was a pause, then he continued: "Will you bid farewell to an old man, who has wronged you deeply?" His hand was outstretched. There was such a pitiful note in Herrick's tone that Manning could hardly keep the tears from blinding him. After all, he could not forget what Herrick had been to him.

"We forgive all, Uncle Dick," said Margaret.

Herrick smiled, "You are a wonderful girl, Margaret," he said: "Make Richard a good wife."

"Good-by, Uncle Dick," said Manning huskily.

"Good-by and God bless you both," Herrick replied.

The two slowly walked from the room. At the door Manning turned and looked back; there sat Herrick, looking weak and forlorn, but smiling faintly. He raised his hand in a farewell salute and the two young people passed out into the world of sunshine.

For almost five minutes the two who had been so joyfully reunited followed the narrow trail which led toward the *Skyrocket*. At length they came to the top of a hill and looked back; there in the clearing they could see the *Phantom*, shining black in the tropical sunshine. Suddenly, as they watched, there burst from the great craft a cloud of dense brown smoke that rolled out over the clearing in huge billows. A dull rumble shook the ground, and a great explosion reverberated through the air. Then the smoke began to settle in a fine brown dust, over all the clearing. When it had completely cleared away, there were to be seen, where the *Phantom* had rested, only an irregular crater and shattered fragments. Richard Herrick was, at last, truly dead, and the *Phantom* of Galon was no more.

Manning sighed, wiped a tear from his eyes, and, taking the hand of his bride in his own, led her down the other side of the hill, to a new day and a new life.

THE END.

DO YOU WANT TO TAKE A TRIP TO THE MOON?

Then read Otto Willi Gail's

"SHOT INTO INFINITY"

in SCIENCE WONDER QUARTERLY

Now on Sale at all Newsstands

Freedom of the Skies

(*Continued from page* 529)

"You have learned how many of these to each plane will make it capable of destroying a city?" he asked.

Fred nodded: "Issue each pilot five of those tablets," he directed. The Grand Master nodded to the orderly, who hurriedly seized the carton which had contained the gold, and departed on his mission. The Grand Master continued to smile.

"Now," said he, "the other package is for your own use on the Great Mission. Let me see its contents."

Brettner opened a smaller package, and revealed a layer of white tablets each about the size of a pea, lying amid wrappers of cotton wool.

"You will retain these for your own use," the Grand Master said: "You will rest for two hours; after which you are to depart in our fastest plane to the capital of the greatest nation in the world"—he spoke ironically—"and destroy it."

Fred winced: "Does that constitute the Great Mission?" he asked.

The Grand Master nodded: "Indeed! And until you have destroyed Washington completely and returned here you shall not see your Nadia. She is safe now; but, unless you carry out this mission in good faith and return here, you shall never see her again, and—and she shall die a horrible death!"

Fred parleyed for time: "Is there no way out of this—cannot we take this city without destroying not only the government of the United States, but all the people who live there?"

The Grand Master's eyes blazed. "None!" he said firmly. "It is your mission to end their lives. The leaders of the nation must be killed, to demoralize it. Blow the city to the four winds, and make yourself one of the greatest conquerors of all time!"

Fred bowed his head obediently.

"Go, then!" said the ruler.

"Before I go," Fred whispered, "I have some information for you which I can give you only in the utmost privacy." He looked significantly toward the brawny bodyguard of the Grand Master, standing at the door through which Brettner had come. The Grand Master looked surprised. He pondered for a moment, then—"Granted," he snapped. He turned to his guard.

"See that we are not disturbed until I ring for you," said the Grand Master.

The guard bowed and walked out.

When they were alone the Grand Master turned to Fred. What he saw made his face turn a ghastly white. Brettner held the Radium-Ray pistol in his hand pointed toward the potentate. His hand went out for the bell-button, but Fred's voice stayed him. "One move means death, Mr. Grand Master. I will teach you that one man cannot control the world. If that can be done, I'm the man! From now on you are to do as I say!"

"You may die any minute," said the Grand Master, his face pale, but still smiling.

"No bluff!" Fred barked. "You will die first. One overt move and you die instantly!"

"Well?"

"Call in an orderly and tell him to release Miss Nadia Deneen and bring her here. If she is already dead, God help you."

The Grand Master pushed the button on the desk, Fred was watching him carefully, his keen eyes alert. As the orderly came in, Fred stood in a position which concealed the gun, while the Grand Master ordered the man to bring Nadia to the office. When he had gone Fred gave further orders.

There was a tense ten minutes of waiting before she came, her face terror-stricken. She stood staring between the two men. With a smile Brettner waited for the Grand Master to give his other orders to the henchman.

"Have all planes take off with the explosives and cover all the cities," the Master said. "Then return to accompany this lady to a plane, and see that it is one airworthy for a cruise ashore."

Nadia's eyes leaped with understanding. With a loving look at Fred, she ran toward him. When the orderly had disappeared Brettner snapped at the Grand Master, "Get over there in the corner, traitor to humanity! Stand where I can keep my eyes upon you and still kiss this young lady!"

Nadia then saw what had happened. She flew into Fred's arms. "You won't suffer any longer, darling," he assured her: "I've just conquered the Conquerors of the World!"

She held him close, while he kept free his right hand holding the Radium-Ray pistol pointed at the Grand Master. The latter at last realizing his position, demanded, "What are you going to do now, Captain?"

Fred grinned and walked closer.

"I am going to send Miss Nadia ashore for the help of the air service who shall hand you over to the arms of justice. True justice for you would mean the torture of waiting days until you should enter a disintegration room, such as you invented for the destruction of innocent men! But as it is, you will get your deserts. Then I shall retire from the air and become—maybe a grower of flowers which I shall use to brighten the Light and Love of my Life!"

The Grand Master interrupted: "Have you thought of all those planes of destruction, Captain, which you just dispatched to the greatest cities in the world!" he said, laughing madly.

Nadia gave a start. Fred smiled as he told her of the terrific explosives and how he had sent those planes of destruction out to deal their worst.

Nadia was amazed and terrified that this could be true. But now she trusted him.

"Have they—have they departed?" she asked breathlessly.

Fred's face suddenly became solemn. The Grand Master continued to laugh madly. "Aha! Splendid, Captain!" he said. "You are also an outlaw. I could not have done better myself. Your best move at present is to remain here and take over my great program!"

Nadia was persistent. "Have they gone—to—to kill people—all over the country?" she asked.

Fred's face was solemn.

"Yes, they've gone," he said: "They've gone to fly over the greatest cities in the world." He turned to the Grand Master, then, and his face broke into a smile.

"But just think of all your planes dropping aspirin tablets over the country like a fleet of advertisers, and no one with the sign of a headache! You're a fine Conqueror. You have the whole world in your power, eh!"

He would have gone on, but Nadia was kissing him

THE END

AVIATION NEWS OF THE MONTH

CONSTRUCTION

R-101 Most Luxurious of Airships

THE R-101, the world's largest airship, is commended as a marvel of luxury by those who inspected it just before completion at Cardington, England. The test flight will be under the command of Major G. H. Scott, who crossed the Atlantic on the R-34. The two-berth staterooms compare favorably with those of a steamship. It has a smoking room, and ash trays are placed beside each berth, this is a divergence from the "no smoking" rule the *Graf Zeppelin* adopted. It will be possible to accommodate fifty or more passengers, and a dance floor is provided for their entertainment. A spacious lounge extends the ship's width. It has five heavy oil engines, four forward and one reverse. It will be capable of traveling at from 70 to 80 miles an hour. It is only 715 feet long, as compared with the *Graf Zeppelin's* length of 776 feet, but it has nineteen gas bags with a capacity of 5,000,000 cubic feet, as against the *Zeppelin's* 3,700,000. The diameter is 131 feet, whereas the *Zeppelin's* is 100. The craft is to prove the practicability of establishing an air-route between England-Egypt-India.

Beryllium Foreseen as Aircraft Metal

A PREDICTION of Dr. W. H. Gilbert, director of the Battelle Memorial Institute, Columbus, Ohio, that beryllium, a light metal now worth $200 a pound, is likely to find extensive utilization in future aircraft construction, is contained in *Science Service*. Beryllium is now in the rare metal class, but because of its light weight—a third that of aluminum—it would considerably decrease the weight of aircraft. It is estimated by designers that it is worth forty dollars to reduce the weight of an airplane one pound. Dr. Gilbert declares, however, that although beryllium is an expensive metal to-day if there were a demand for it, it could be obtained in quantity at a price of about $25 to $50 a pound. Geologists estimate that there is as much beryllium by weight in the earth's crust as lead or zinc, and much more by volume. Because of its present high cost, little is known as to its ease in fabrication and endurance. It is known to have a higher modulus of elasticity than other light metals and this property nearly equal that of steel, promises to allow aircraft designers to use methods of construction not now possible. It would be well Dr. Gilbert declared, for aircraft manufacturers to investigate the possibilities of this metal.

800 Miles an Hour with 100-Ton Planes Predicted

IGOR SIKORSKY, aircraft builder and designer, has predicted that in a few years we will see giant air liners, weighing 50 or 100 tons, with a carrying capacity of 200 persons, that there will be a regular thirty-one hour trans-Atlantic transport service; and that planes will be able to attain a speed of from 500 to 800 miles an hour at an altitude of 25 miles. Mr. Sikorsky states that the sole reason huge air liners do not exist to-day is the reluctance to invest so much capital in a single flying unit. The wings of the planes will carry the bulk of the passengers on the future liner, he says, and each will will be capable of accommodating fifty persons. There will be no danger of flying such planes blind through storm and fog, as flying will be guided by the use of instruments and the great driving power of thousand horsepower motors will reduce the hazard. Mr. Sikorsky bases his opinion of attaining a speed of 800 miles an hour on Professor Einstein's theory that, if planes fly at an altitude of 25 miles, they will be in the stratosphere, where the air is so rarefied that it has no retarding effect on the progress of the plane. By hermetically sealing both the passenger and engine compartments, and artificially maintaining normal pressure, it will be possible to reach this speed.

New York May Have Central Air Terminal

A SURVEY has been made of the metropolitan district of New York from an airplane by W. J. L. Bonbon, president of the New York Board of Trade, with a view to choosing a suitable site for a Grand Central Air Terminal. The locations most satisfactory are Governor's Island, the west bank of the Hudson, or the Bronx. The site of such a terminal should be convenient to the important city transportation lines, hotels, railroad stations, and the shipping district, Mr. Bonbon stated. He predicted that the city will have ocean airport terminals, union steamship terminals, and union railroad terminals. The steamship companies would never have obtained control of the New York waterfront, he said, had the leaders of a decade or two ago foreseen the development of the city.

Work on Ocean Landing Platforms Progressing

THE work on the first of what may be a series of ocean landing stations for airplanes is now progressing rapidly. This platform will be anchored to the floor of the Atlantic between New York and Bermuda. The United States hydrographic ship *Hannibal* some weeks ago made a survey between New York and Bermuda and confirmed a report of a mile elevation on the Atlantic floor. The plateau is about four miles square and 5,000 feet above the surrounding ocean bed. It provides a surface of clay that would afford good anchorage for the moorings. If the plan is adopted for the construction of a series of trans-Atlantic stepping-stones, considerable more surveying will have to be done, further and more surveys made to ascertain the most suitable locations for the placing of the platforms.

400-Passenger Airship to be Built by Burney

COMMANDER SIR CHARLES DURNEY, who is building the great British Dirigible R 100, is now working on plans for a new ship that would carry 400 passengers, besides a suitable crew. He says that even the R-100, though not yet fully completed, is already "obsolete" and that, if he had had his way it would never have been built. Ships much larger than the R 100 or the *Graf Zeppelin* must be built to make trans-ocean air transportation practicable. The Air Ministry, however, is of the belief that the present ships, the R 100 and R 101, must be proved practicable before larger vessels are constructed. The new ship would have a single large hull in which everything would be contained, instead of separate gondolas for the engines. The envelope would be more streamlined, and the hull would extend the whole length of the underpinning.

"Tin Bubble" Has Successful Flight

ANOTHER stride forward has been made in lighter-than-air aeronautics by the successful cross-country trip from Detroit to Lakehurst, N. J., of the all metal dirigible ZMC-2, at an average speed of forty miles an hour. Captain William Lefaux U. S. A., was its pilot. A new composition of planes called alclad (having a base of duralumin coated with a thin layer of metal steel), is used in the construction of this ship. Two Wright 4 horsepower motors are used, and the ship has a capacity of 200,000 cubic feet of helium gas. It was built as an experiment for the United States Navy, and as this is the first successful flight of a craft of its kind, it may be the precursor of larger dirigibles built of the same material. It has a cruising range of 1,200 miles and can carry a crew of four with 1,000 pounds of provisions or ammunition.

Floating Airship Will Assure Safe Travel

AN airship capable of floating in the water and docked like an ocean liner, is the plan described in a new book by Commander Sir Charles Burney, builder of the R 100. Ever since he began the construction of this latest airship, he has been experimenting with the possibility of a floating dirigible, and he believes that when such a one is constructed it will revolutionize the future of long-distance air travel. He has called the proposed sea-going dirigible the "all-metal" ship as its great curtained are elliptically shaped instead of circular, as in the present airship. Beneath the hull, which will be built on ship's lines, will be two huge pontoons as far apart as is possible. These will scoop up water for ballast and keep the ship floating until the passengers disembark on small boats. Commander Burney is of the opinion that the present system of mooring masts at land stations is not satisfactory; it leaves the airship at the mercy of sudden gusts of wind. He suggests a "land docking raft," consisting of a telescopic mooring mast mounted at the end of a platform, which is pivoted at the end of a railroad leading to the hangar. Vertical arms on either side of the platform will hold the airship firmly, and the whole structure, including the mooring mast, can be swung like a turntable until it points to the hangar and run into the shed safely.

New Hanger to be Largest in the World

AKRON OHIO, is to have the largest hanger in the world, designed for the Goodyear-Zeppelin Corporation, and now under construction, which will be used for the assembling of two super-dirigibles being built for the U. S. Navy and will house them when completed. The sides of the hanger are to slope, and the top will be arched, while the general appearance will be that of an enormous culvert cut in half. It is then fashioned to present the least amount of resistance to the wind, according to the architect, Wilbur J. Watson. It will be 1,175 feet long, or half as long again as the hanger at Lakehurst, 325 feet wide and 197½ feet high. The round doors of the hanger will probably be the most unusual feature of the building, according to Mr. Watson. They are supported on forty forged steel, double-flanged wheels, twenty-seven inches in diameter and run on two rails weighing 100 pounds per yard each. The wheels are mounted on bearing boxes and rest against heavy springs, which will permit of the equal distribution of the weight. The doors are operated by electric motors and can move at from twenty to forty feet per minute.

Miniature Models of Planes Used in Tournaments

A NEW kind of airplane derby has been originated. In this derby the contestants are boys and girls and the machines are miniature planes that look and fly like the original thing. Young America has become greatly enthusiastic about aviation, and the parks and playgrounds are full of youngsters constructing naval and ingenious planes, which they fly with great dexterity. Clubs are being formed by them, and Boston alone has 60 model aero clubs, with a total membership of 3,000. Aircraft clubs in Detroit made 1,065 model planes in seven months. Cities of the United States and Canada are constructing model aircraft buildings through local playground and recreation departments. The *Spirit of St. Louis* has been a very popular model for most youngsters. Another form of plane is one using skyrockets as means of propulsion, following the idea of Fritz von Opel. One plane is said to have remained aloft for seven and one-fifth seconds employing metal tanks equipped with pistons as motive power.

Girls, too, seem to be taking interest in this sport, and Miss Amelia Earhart, noted trans-Atlantic flyer, is reputed to have said that some of them prove better carpenters than males.

OPERATION

Two Parachutes Used

THE advisability of aviators having two parachutes strapped to them, is voiced by C. H. Allen in *The New York World*. By such a practice many casualties might be avoided. This is especially true of "stunt" or exhibition jumpers. The army and navy for some time have required that a double parachute be carried by their exhibition jumpers, one strapped to the back and the other to the chest. An incident cited to prove the utility of this plan as a safeguard to flyers, occurred at the 1926 national air races at Philadelphia, when an exhibition jumper, after a delay in releasing the cord for a "delay opening" effect, found his parachute ripped from rim to crown, and he had to have recourse to the emergency one to bring him safely to earth.

Flight Made Solely by Instruments

TAKING off from the ground, making a short flight, and again landing very close to a marked spot on the ground, Lieutenant James H. Doolittle, while working under the auspices of the Guggenheim Fund, made a successful test of flying solely by instruments at Mitchel Field, New York. This flight, in the opinion of Harry F. Guggenheim, president of the Fund, marks the end of the terrible fog menace. Doolittle was in a fully-enclosed cockpit, unable to see anything of the outside world. In place of the natural horizon to guide him, he had in his plane an "artificial horizon," a small instrument which indicated the longitudinal and lateral attitude of the plane with reference to the ground. With stability assured, he was able to locate the landing field by a direction-finding radio receiver. In addition to the usual long-distance beacon, there is also at the field an auxiliary beacon to enable pilots within 15 or 20 miles of the field to find their way to it. Mr. Guggenheim believes that, with these and other devices that were used for the first time, the weather hazard will vanish and, in fact, the plane will be more independent of weather than any other form of transportation.

Lightning Doubted as Menace to Aviation

THAT lightning is a menace to aviation is now a question of dispute. It is stated that there has been no decisive proof that airplanes destroyed by fire during thunderstorms have been struck by lightning. Many other causes might bring these disasters about. According to Dr Joseph E. Woodman, professor of geology and lecturer on aeronautical engineering at New York University, investigation has shown that the plane in which the Mexican flyer Carranza was killed, was destroyed when he attempted to land during the storm and crashed into a tree. If a pilot could be found to say positively that his plane had been hit by lightning, Prof Woodman says, then matters would be different. A body must be heavily charged with electricity for lightning to strike it. Those who hold that lightning strikes a plane do so on the assumption that the plane gets charged in flight by accumulation of charges. But this has never been proved. On the other hand, Professor William Jackson Humphreys of the Weather Bureau, Washington, asserts that the danger of an airplane being struck by lightning is 100 times as great in the air as when on ground.

New Epoch of Air Transportation Predicted

CONSIDERING the movements covered by both airplane and dirigible, it is clear that we stand at the threshold of a new epoch of transportation, says T. J. C. Martyn in the *New York Times*. It is also clear that dirigible and airplane are to be pitted against each other for supremacy, and it is possible that they may develop into complements of each other. Diesel-type engines, or possibly modified oil turbines, are being considered for use for airplane propulsion. Indications are that moving wings will make possible vertical ascent or descent. It is not likely, according to Mr Martyn, that the airplane will be able to carry the pay loads of a dirigible. On the other hand, the dirigible can never expect to attain the speed of an airplane. The dirigible will always have a greater flying range than the airplane, and will be more spacious and luxurious; but the faster speed of the plane will permit it to outride a storm faster than the dirigible and to land more readily. A dirigible is apt to become helpless in a bad windstorm; but in the case of engine trouble it is much safer than a plane, which must land, whereas the airship may remain aloft until repairs have been effected. The writer predicts an airship that will be as luxurious and as well appointed as a steamship.

Airplane Speed to be Doubled in Ten Years

LOUIS BLERIOT, the first man to fly across the English Channel, predicted recently that within the next ten years it will be possible to attain a speed of 250 miles an hour by airplane. He recalled that, when he flew across the Channel, his speed was 60 kilometers (37.5 miles) an hour, whereas to-day the speed of nearly 400 kilometers per hour has been reached. On such progress, he said, we may base an expectation that to-day's speed will be doubled in the coming ten years. He expects to offer a Blériot Cup for speed contests, between land planes just as the Schneider Cup is for seaplanes.

Tandem-Winged Monoplane Has Successful Flight

A SUCCESSFUL test flight of the tandem-winged monoplane built by the Fernic Aircraft Company of Staten Island was made with George Fernic, its inventor, at the controls. It stayed aloft for twenty-two minutes with a gross weight of more than 2,000 pounds, and attained an altitude of 1,500 feet. It descended with a new type of three-point landing, the three points being the contacts of the three wheels, with the tail high in the air and the plane in flying position ready to take off again. It is said to be impossible to stall it in the air, although the test did not take in this phase of its design. The plane has a carrying capacity of 1,000 pounds and has two Wright *Whirlwind* motors of 221 horsepower each. It has a cruising radius of 1,000 miles and a speed in excess of 130 miles per hour. The plane is scheduled for a non-stop flight to Montreal, Fernic's native land.

"Aviation News of the Month"

portrays in plain, yet concise language every important aviation advance during the month. Nowhere can the average reader get such a wealth of accurate and vital information condensed into such a small volume. Some 40 aviation magazines and newspapers are utilized by our editors in the compilation of this department. The publishers welcome short contributions to these pages from the various scientific institutions, laboratories, makers and distributors of planes, etc.

Experimenters Work on "Flying Wing"

GERMAN airplane constructors are evolving a new kind of airplane, which will have no tail, rudders, elevator planes nor the long fuselage that houses the cabin. One of these planes, built by the Rhön Rositten Company, and equipped with an engine of less than 75 horsepower, recently made a successful flight and attained a speed of over 70 miles per hour. Movable surfaces, both vertical and horizontal, at the ends of the wings, stabilize and steer the craft, and permit the pilot to make it climb or glide downward at his will. The plane is propelled from behind, and the main advantage of the plane will be the reduction in air resistance due to the absence of the fuselage and tail. Designers are also experimenting with a "flying wing" type of plane. This plane will consist of a wing structure only, which will contain the engines, pilot's seat, passengers, and all essential machinery; and this, it is hoped, will greatly lessen air resistance. A factor which will have to be solved in connection with this type of plane is whether it is better to have the propellers in front of the wing, or behind it. Both positions have advantages and disadvantages. Propellers placed in the rear of the wings have nothing to obstruct their slip-streams but, on the other hand, will have to do their work in "disturbed" air, because of the wing in front and away from the leading edge to give proper efficiency in operation. This will mean that they will have to be mounted on extension shafts, or the engines mounted forward of the leading edge in special nacelles. This, too, like having the propellers in the rear, is not an ideal arrangement.

Bell Telephone Has Flying Radio Laboratory

THE largest and most complete radio laboratory in the world is now in use by the Bell Telephone Laboratories. This is a Ford trimotored all metal plane and will be used for the development of radio apparatus for aircraft communication from the earliest experimental stages through to the final testing of the finished apparatus under actual flight conditions. The plane has been equipped with two large laboratory benches and a number of antennae. It will have two trailing-wire antennae and two stream-line vertical rod antennae. Supports also have been erected on the wing tips for the mounting of various types of experimental antennae. Generators and storage batteries will supply the power.

Catapult Practical Method of Launching Planes from City Roofs

A PRACTICAL way of launching airplanes from the restricted areas of city roofs, is suggested by Lieut. J. J. Clark, U.S.N., in the *New York Times*. The principle is borrowed from earlier modes of warfare, and has proved its practicability in the navy since its first test in 1915. The plane is shot into flight by a catapult. From its rush down a sixty-foot track it can attain a speed of sixty miles an hour in one and a half seconds. This method of launching airplanes is entirely safe, he says, and to date there has been no fatal accident through its use in the navy. The only fatality on record was when a land plane took off in the wake of another and was hurled over the side by the air blast from the leading plane. Plane operations from roofs of houses would be even more simple than from carrier decks of a battleship. Most buildings are sufficiently strong to withstand the blows of airplane landings, he says, because of the rubber-tired wheels of the planes and the shock absorbers used. Future construction of buildings could provide for the additional weight of a roof airport.

European Airdromes Praised

MAJOR CLARENCE M. YOUNG, who is to be Assistant Secretary of Commerce for Aeronautics, praises the uniformity of airport rules in Europe. At Croydon the airport, including buildings and equipment, is owned and controlled by the British Air Ministry. The direct administration of the airport is under an airport director or chief airdrome officer. The buildings, including administration, hangars, shops, etc., were constructed by the Air Ministry and the space in them is leased to the various companies operating from the airport. Five different airlines operate from the Croydon Airdrome. Each arriving plane, whether running on schedule or not, must land to a platform or "tarmac," and report in. Departing planes must also taxi from the platform and await a signal from the tower before taking off. Croydon, Le Bourget and Tempelhof airdromes, being adherents to the International Convention of Air Navigation, abide by the regulations adopted at the convention, and planes approaching these airdromes must follow a uniform procedure of landing, such as circling the airdrome to the left before coming in. And, if two planes are ready to land at the same time, the one flying at the higher altitude must maneuver to avoid the other.

Air Corps Has New Parachute

A REVOLUTIONARY type of parachute that may ultimately take the place of the standard one now in use has been developed by the Army Air Corps at the experimental laboratories at Wright Field, Dayton, after more than a year's research.

Though the materials, general size and principle of operation of the present-day "flyer's umbrella" are utilized, the newcomer has a different kind of material, with far more stability and safety of operation; and a unique type of "pilot" chute.

Instead of the circular material, there has been substituted a triangular one with two corners rounded and the third shaped straight across. The shroud lines extend down, spaced regularly as in the standard 'chute, except across the shroud-cut corner, which has no shroud lines at all. The result is that, when the parachute is open, this corner forms a tail-like vent through which the air escapes.

More than a dozen jumps and a hundred dummy drops have been made with the new 'chute. These indicate a decreased oscillation and shock to the jumper at the time of opening, besides greater steerability in descent. This improved operating is accomplished mainly by the new material. The air escaping through the tail-like vent propels the 'chute horizontally at a speed of from three to four miles an hour.

GENERAL

Investors Warned Against Aviation Swindles

A NOTE of warning is sounded by the Better Business Bureau to prospective students of aeronautics as well as to investors in stocks of companies organized for false aviation promotions. It is estimated that millions have been lost already by investors in swindles of this nature. It is stated that, according to Government authorities, it costs about $2,000 for the ordinarily trained young man to become a transport pilot. Many of the aviation schools have students with promises of a job after a few brief lessons, and perhaps, ten to twenty hours of solo flying. Fifty hours of flying are required for even a limited commercial license and 200 hours are required for a transport license. In fact, most large companies demand from 500 to 2,000 hours of solo flying before hiring a pilot. Therefore, the suggestion is offered to those interested in taking up a course in aviation, that they thoroughly investigate the school they expect to attend. Likewise, investors in aviation stocks should use extreme caution in their investments; although, without a doubt, substantial earnings may be expected to accrue from investment in legitimate aviation enterprises.

X-Ray Makes Flying Safer

THE use of the X-ray in the testing of aluminum parts of airplanes is making flying safer, according to W. L. Fink, metallurgist of the Aluminum Company of America, speaking at the National Metal Congress. The x-ray used is the same as that used by physicians and surgeons; and the resultant shadowgraphs disclose defects in the castings, such as blowholes, pinholes, porosity shrinks and the presence of refractory materials from the melting furnace and other foreign matter. The examination of these indicates the way for their elimination. This may be accomplished by altering the risers or changing the chills when casting. The defects may also be remedied by changing the core or the pattern from which the casting is made. The study of the shadowgraphs leads to careful control of foundry practice and, as a result, better castings are turned out.

Americas Offer Great Field for Aviation Expansion

HARRY F. GUGGENHEIM, president of the Daniel Guggenheim Fund for the Promotion of Aeronautics, says in the *New York Times* the Americas offer a large field for air expansion. The airplane has a distinct advantage in speed over any other form of transportation. Even at its present stage of development, it can carry a number of passengers at a speed of 120 miles an hour. In the matter of construction and maintenance of an airway, the cost will be insignificant in comparison with that of railroads or the maintenance of roads. Mr. Guggenheim predicts that the annoying noise from the motors now heard by air passengers will be eliminated in the airplanes of the near future. As a factor in bringing about peaceful relations between the two Americas, the airplane will be a big factor. Mr. Guggenheim quotes President Hoover's words at an address at Lima, Peru, that "to destroy the distances between peoples is to construct friendship between them."

Preference Given American-Built Planes in Foreign Countries

FOREIGN countries seem to show a preference to American-built planes, according to officials of the Ryan Aircraft Corporation, a unit of the Detroit Aircraft Corporation. This is because of the superiority of construction of the American plane and their simplicity, which permits them to be set up, piloted and serviced by comparatively inexperienced pilots and mechanics. Another consideration is the reputation of American manufacturers for fair-dealing and the American system of standardization which allows parts and replacements to be shipped with the assurance that they will be perfectly interchangeable. In the last eighteen months the Ryan corporation alone has sold 30 Ryan Brougham to foreign countries, including China, Mexico, Guatemala, Canada, Argentina, and many European and South American countries. It is an interesting fact that these countries incapable of manufacturing their own airplanes are turning to American-built planes, despite certain trade barriers and price and credit concessions offered by manufacturers in other countries.

"Hasten Slowly" Policy to be Adopted by Aviation Industry

THERE is something of a lull in the aviation industry and manufacturing plants are curtailing their production, according to the *New York World*. This is a wise policy, inasmuch as there has hitherto been too much of the over-confidence and optimism that usually goes with a new and growing industry. This lull is not simply a matter of overproduction, but an attempt to have the industry grow normally without trying to force it too much. The American public, according to *The World*, is by no means "air-minded" at the present time, and the average person cannot simply consider the guiltless of cabin doors without assigned as sufficient reason to change his ideas regarding the laws of gravity ingrained in him for countless generations. It will take years and the arrival of a new generation, before the public will consider that the atmosphere is a real substance like water and earth and capable of supporting tremendous weight. Aviation methods change rapidly and the present type of engines and ships are apt to be changed at any time by revolutionary discoveries in the art of flying.

ROCKETS

Moon Rocket in Forefront of German Experiments

THE question of building a rocket that can penetrate into outer space, and possibly to the moon, is holding the attention of scientific circles in Germany, according to Guido Enderis in the *New York Times*. With men such as Professor Hermann Oberth, Max Valier and Fritz von Opel experimenting with the possibilities of the rocket, much is expected to develop. Professor Oberth, who has been working on the rocket principle for many years, is now having his experiments financed by the UFA Film Company of Germany. This company, which has made many pictures of future accomplishments, in one making use called "The Girl in the Moon," and the girl uses a rocket ship developed by Professor Oberth. The professor however is cautious in making statements about his goal, he will make the moon rocket still a "dream," being apparently content to build a ship that can attain an altitude of thirty miles, and have it return to a designated spot. The first tests of his development are expected to be made on the North Sea coast in the near future.

Opel Makes Flight in Rocket Plane

THE first successful flight of a rocket plane was made recently in Germany by Fritz von Opel, manufacturer and sportsman, who flew a mile and a quarter in pressingly seventy-five seconds at an average altitude of 40 feet. The plane, a combination of rocket ship and glider, weighed about 500 pounds when fully loaded with the rockets and carrying the pilot. After two unsuccessful attempts to get his ignition system to explode the rockets properly, Opel essayed again. He was shot along a track, on which the machine rested and then catapulted into the air at a speed of about 85 miles an hour. Three rockets, each weighing ten pounds, were used to shoot him off the ground, each rocket burning for exactly two seconds. The rocket which carried him through the air burned for twenty-five seconds, each generating a total lifting power of 1,325 pounds. The speed is regulated by the frequency with which the rockets are touched off. After all of them are exhausted, the plane can glide to earth. Opel states that he not only expects to build bigger and better rocket planes, as this effort was only a crude experiment, but also intends to use the rocket principle on regular planes both to give them power to take off from the ground and to serve as a brake when landing. He expects soon to cross the English Channel in a rocket plane. Opel is also the builder of a rocket-propelled motor car, with which he attained a speed of 120 miles an hour, eight seconds after starting.

Rocket Proposed as Mail Carrier

A SPACE rocket has been designed by Professor Hermann Oberth, Austro-German scientist, in about upward for thirty-two miles. The purpose of this first flight will be to measure the physical and chemical properties of the atmosphere. The ultimate idea is to construct a rocket that will carry mail from Germany to the United States in about thirty minutes. The UFA Film Company is supervising the building of the rocket, which will be fired from a ship in the North Sea to obviate the possibility of damage. The propellant will be liquid air. The mail rocket, if constructed, would have automatic steering apparatus and a parachute to permit its slow descent to earth when it reached its destination.

Rocket Airplane Heralds Successful Space Voyaging

VOYAGES through space, from earth to the moon, or to other planets, are foreseen by the recent successful demonstration in Frankfort of a rocket-propelled airplane. In May, 1928, Fritz von Opel, German automobile manufacturer, demonstrated his rocket automobile. Now, after further experiments, he has built an airplane, propelled by the same means, and shown that it is capable of flight.

Interesting as the method is, there is little likelihood that it will ever become a serious competitor of combustion engines in terrestrial vehicles, or airplanes for use in the lower portions of the atmosphere, says Science Service. The rocket depends for its propulsion on the kick given by the explosions. It uses its fuel, whether gasoline, hydrogen and oxygen, or explosives, very rapidly but only a small amount of the fuel's total energy is available to furnish the necessary "kick." In other words, the rocket has a low efficiency. Where the same fuel can be used to apply energy to the ground, as in the automobile, or to the air, as with the airplane, it is better to use the wheel or propeller to obtain traction.

In getting through the space between the planets, containing thinner air than the "vacuum" of an incandescent lamp, however, the situation is very different. There no air, ground or water against which to push is available, and the rocket is the only known means of propulsion. The kick of an explosion is just as powerful in a vacuum as in the air; for the push is against the gases formed by the explosion. In fact, in a vacuum, the rocket would tend to travel somewhat faster, because of the lack of atmospheric resistance.

The theoretical investigations upon the practical uses of the rocket were begun by Prof. R. H. Goddard, American physicist, at Clark University, Worcester, Mass. Later mathematical studies were made on the same problem by Prof. Max Valier of Munich, and Albert Hunther. The results of the latter were made available to the Opel company's engineers.

Some years ago Prof. Goddard startled the scientific world by publishing data showing the possibility of a rocket flight to the moon. These researches have been continued by him ever since, under the auspices of the Smithsonian Institution. His rocket, he figured, would travel at a speed of 6.6 miles a second, nearly 400 miles an hour. This speed would be sufficient to allow it to escape from the earth's gravitational attraction, and to take it to the moon in eleven hours. He also was that the rocket would not carry a passenger but would bear a charge of flash powder, to explode upon impact at the moon's surface. This great flash could then be observed through earthly telescopes.

A Rocket to the Moon Not Impractical

PROFESSOR ROBERT H. GODDARD, writing in the *New York Sunday World*, expressed his firm belief that rocket flight to the moon and other planets will one day be an accomplished fact. He states that the whole subject of rocket flying is a legitimate branch of speculative physics and is convinced that there is a solution for every problem involved; even to the matter of a return trip from the moon. From 1914 to 1920, Professor Goddard conducted experiments at Clark University with rockets shooting combustion powder through nozzles in an attempt to secure high speed, and speeds as high as 8,000 feet per second were obtained, which figure has never been equaled by any other worker on the subject. Professor Goddard's experiments are now being financed by the Smithsonian Institution, chiefly to study conditions in the upper atmosphere. Direct measurements of conditions in the air have been made as a height only of twenty miles, and even accomplished by instruments suspended from balloons. The balloon and the airplane cannot pass into the upper regions of the earth's atmosphere, as there is not enough air to support them. The rocket is the only means of exploration. By sending rockets equipped with instruments into the air simultaneously at different parts of the country, high-altitude weather maps could be obtained. A practicable rocket, Professor Goddard believes, should consist almost entirely of propellant, with very little actual rocket. Before interplanetary travel could be started, however, it would be essential to have a comprehensive study of the nature of the earth's atmosphere. He scores as a fallacy the statement that the terrific forces in the acceleration of a rocket would destroy a human being, as well as delicate instruments. Tests have proved his contention.

THIS department is open to readers who wish to have answered questions on Aviation. As far as space will permit, all questions deemed of general interest to our readers will be answered here. And where possible illustrations will be used to answer the questions. Queries should be brief and not more than three should be put in any letter. Address all communications to the Editor.

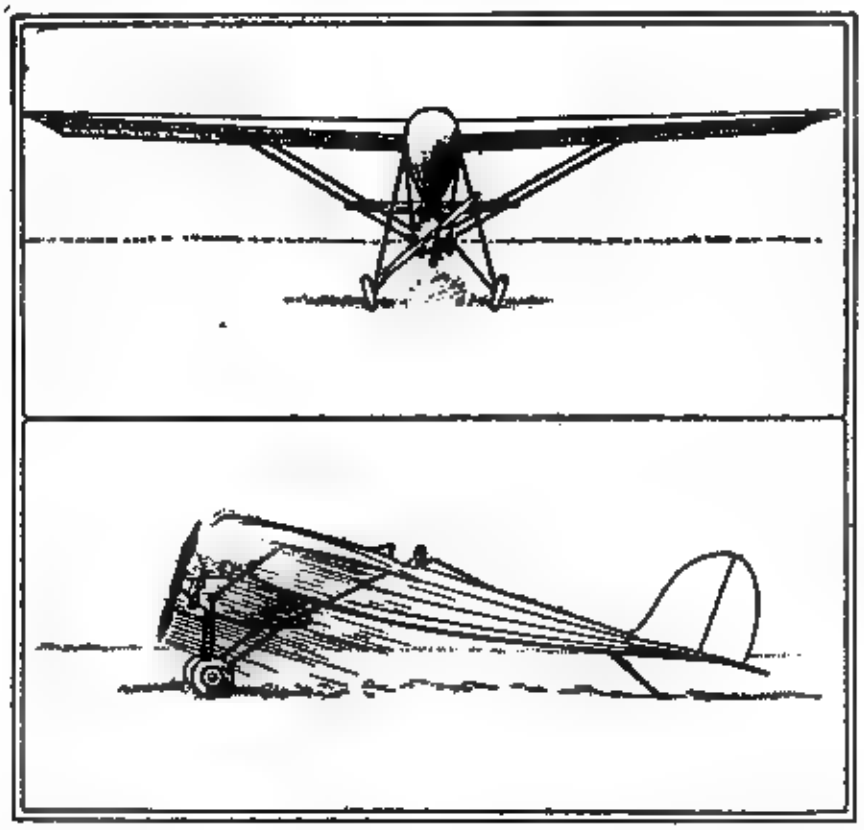
Why Not a Motor Under the Wings?

Editor, Aviation Forum:

I have read your AIR WONDER STORIES of September, and would like to know why the idea of Lowell H. Morrow in his "Air Terror" of having the motor under the wings, is not [illegible].

FRED BOLTE,
Detroit, Mich.

(A great many ideas that are fine from a general scientific standpoint do not work technically. The business of the scientist is to outline general laws of nature and to indicate a possible application for them. It is the job of the engineer to design and actually [illegible] the machine, and to weigh its advantages and disadvantages in practice. As we see it [illegible] idea of Mr. Morrow might be scientifically feasible; but from a technical or engineering standpoint we believe that the stability added to a plane would be offset by the great loss in power. The analogy of a plane with a bird is somewhat fallacious, for a bird's power plant is in the muscles of its wings. A plane must have the power plant, for economy, driving the propeller directly. Now the propeller must, in screwing the plane through the air, throw backward great gusts of air. If the power plant, and therefore the propeller, were built under the body the propeller would be thrusting back toward the body of the plane great volumes of air and therefore increasing greatly the "parasitic" resistance of the plane. If the power plant were located below the body, then the plane would have to be built upon stilts. This is indicated in the accompanying illustrations.—*Editor.*)



The upper illustration shows that by putting a motor entirely under the fuselage it would necessitate raising the plane higher off the ground and at the same time make an ever-present danger of the propeller snapping off while landing or taking off.

The lower illustration shows the increased resistance caused by having the motors just under the fuselage.

What is Neutronium?

Editor, Aviation Forum:

In various articles that you have written and the story, "Where Gravity Ends," you have spoken of Neutronium as the heaviest substance known. I would be very grateful to you for any information that you could give me concerning this substance and proof of its existence.

[illegible]
Redwood City, Calif.

(Neutronium is not known to be an actual substance in existence. It is a possible substance that will come into existence under certain conditions. It has long been recognized that even the most dense of our elements are relatively porous substances. Between the electrons and even between atoms there exist empty spaces, thousands of times greater in volume than the bits of material. Now it is believed and calculated that, if the empty spaces between the atoms could be filled with substance, then a material which would weigh 16,000,000 pounds per cubic inch would result. This hypothetical substance is known as neutronium. It would be so heavy that the earth's crust could not support it. As yet no such substance has been made.—*Editor.*)

Why Not the *Jupiter* Invisible?

Editor, Aviation Forum:

I have just finished reading the current issue of AIR WONDER STORIES. I class stories as follows:

1. "The Robot Master."
2. "The Ark of the Covenant."
3. "The Invisible Raiders" (more of Mr. Repp's stories, please).
4. "Through the Air Tunnel."
5. "Around the World in 24 Hours."
6. "The Sky Maniac." (Mr Juve's stories can't get me interested at all.)

In "The Invisible Raiders" the professor's infra-red television outfit was very good; but if the raiders' invisibility was neutralized while landing on the *Jupiter*, why was not the *Jupiter* made invisible? Please explain.

BILLIE FINCH,
West Palm Beach, Fla.

(An explanation must be made in the question asked here, on the matter of invisibility. There is no absolute invisibility. An object that exists can be seen, but it may not be seen by us. Therefore, to our eyes it is invisible. Now, in the story, the raiders' invisibility was neutralized by the professor's equipment and to those using the equipment they were no longer invisible. By other persons, however, the raiders could not be seen.

The invisibility of the raiders would have absolutely no effect on the *Jupiter*, one way or another. However, if the raiders had turned their invisibility apparatus on the *Jupiter* then it might have been a different story. We hope this clears up the question.—*Editor.*)

Higher Altitudes by Gear Shift

Editor, Aviation Forum:

Is it possible, by adding a gear shift (and can a gear shift be made light enough?) to raise a plane higher by speeding the "prop" faster than the engine in higher altitudes and the consequent thinner air? If the difficulty is in arranging the gear shaft or its weight, would it be likely to lift the plane to a sufficiently greater height? If not, why not?

The ideal arrangement for serials is One serial per issue, and no serial unless *exceptionally* fine to run in three issues. In four issues, never.

JERRY NOONAN,
c/o Apache Inn,
The Valley Ranch, New Mexico.

(What is proposed here might be scientifically feasible; although it is to be doubted that it is technically possible or that it will solve the problem that confronts altitude seekers. There is no doubt that one of the difficulties encountered at high altitudes is the obtaining of a sufficient tractive effect on the thin air. This might be obtained by speeding up the propeller, but there are several disadvantages; the first is that propellers are already operated at high speeds, and it is to be doubted whether they can stand the increase in speed necessary to obtain the added lifting effect desired. The second point is that what is really necessary is to obtain more instantaneous traction on the air, instead of merely speeding it up. In other words, by adding more propellers, more air would be cut at the [illegible] and thus give a greater lifting effect. But the greatest problem that confronts the designers is that of obtaining more power from the engines at high altitudes; the rarefaction of the air does not provide oxygen in sufficient quantities for the engine. Superchargers have been resorted to, and so far they have been fairly successful; these pump in air faster and thus make up for the deficiency in the atmosphere. But Mr. Noonan must not think that by speeding up the propeller he will obtain more power; he will merely divide the power between a greater number of revolutions. From a theoretical st[illegible]point, however, his idea is very interesting and we should like to see Mr. Noonan develop it further.—*Editor.*)

The Rocket in a Vacuum

Editor, Aviation Forum:

Would you please enlighten me concerning the moving of an object through a vacuum by rocket propulsion?

How can an object be guided in a space void of atmospheres in interstellar space?

What are the plausible means of interstellar travel?

Thanking you, I remain one of your most enthusiastic readers,

BILL ROSE,
Venice, Calif.

(If two men were out in space and they were to flex their arms, place palms together and then push against each other they would both move, and in opposite directions. The movement would be caused by their muscular action in creating a force that pushed against both at once. The same thing takes place in a rocket. The gases resulting from the explosion of the rockets have a great tendency to expand [as the gases in any cylinder]. This tendency constitutes a force; and when the gases expand and rush out of the exhaust the force of this movement pushes the rocket in the opposite direction to the exhausted gases. Now just as the motion of the two men did not depend on the atmosphere so the motion of a rocket does not depend on it. And in a vacuum where the resistance to motion is reduced to almost nil the rocket develops its greatest power.

The guiding of the rocket can be done by having tubes set at all angles in the craft. Thus if one wishes to go to the right a rocket on the left is shot, and vice versa. If one wishes to go backward a rocket on the front is shot off. The control is perfect.

The most plausible means of interplanetary [not interstellar] travel developed so far is the rocket machine. A gravity nullifying craft, however, would almost entirely solve the problem of flight. "The Shot Into Infinity" in the Fall SCIENCE WONDER QUARTERLY is a story of interplanetary flight based on the rocket machine.—*Editor.*)

(*Continued on page 564*)

THE READER AIRS HIS VIEWS

IN this department we shall publish every month your opinions. After all this is your magazine and is edited for you. If we fall down on the choice of our stories, or if the editorial board slips up occasionally, it is up to you to voice your opinions. It makes no difference whether your letter is complimentary or critical so whether it conveys a good old-fashioned brickbat.

All of your letters, as much as space will allow, will be published here for the benefit of all. Due to the large number of mail, no correspondence in this department can be answered individually unless 10c in stamps to cover cost and postage is remitted.

THE great number of communications written in answer to Mr. Keesling's letter in the October issue, on the question of serials, more than exceeded our expectations. We have received several hundred on the said topic until this problem now finds quite a few letters. Nearly six per cent favor—"the longer the better." We have been very careful to pick out the representative letters, and are printing as many as space will permit. We have absolutely no preference in the matter. Even if our readers want twenty three-page stories, or one sixty page story we would give it to them. So your letters are the best indication of your wishes. To those who agree or disagree with the views set forth in the letters printed here, we cordially invite you to send in your opinions. We print most of them (letters without comment for on the whole they speak pretty definitely for themselves.

Women Have Patience Too

Editor, AIR WONDER STORIES:

I have just today received our copy of Air Wonder Stories and as I always turn to the readers' columns first of all I was much surprised to find Mr. Keesling's letter concerning serials. My vote is for the longer stories and very much enjoyed "The Ark of the Covenant" (but I do not think I would have enjoyed it as well if it had been separated into two issues of your magazine, along with the other stories. How could it be an interesting story if we had only half of it, would be left up in order to do so, or else you would have had to forego printing it. Why deprive the rest of the readers from reading a good story because some may have the patience to wait until it ends? Mr. Keesling's request is childish and unreasonable, I think. Good stories should be printed regardless of length—the longer it is, the more I enjoy a fine story. Certainly a good story is worth waiting for, as all good things are. Oh, those men who haven't the patience to wait for an ending to a story they are reading—and as they think interesting stories must be sacrificed because they can't wait until the end of three or four months! There are plenty of short-story magazines on the market if Mr. Keesling wants to read them—but don't by any means do away with the serials—print at least two a month, and I certainly don't object to three (not as they remain interesting, and anyhow, it gives one something to look forward to eagerly every month—not that the readers don't "pester" the postman or haunt the newsstands waiting for your wee magazines to arrive. Let it not be said that all men lack patience and I hope that our readers will come forth with a loud "Aye" for serials and also members of the fair sex let it not be said that we women haven't patience either to wait for a good story. Please pardon my criticism of your letter, Mr. Keesling, but truly, you're unreasonable when you expect a three- or four-month serial to be crammed into one issue. It's evident that the story meets with your approval or you wouldn't get it every month.

As to your covers, both on Science Wonder Stories and Air Wonder Stories—they are marvelous. I mean both the covers and the magazines themselves. Why will people consider bright, cheery colors vulgar? If color will help to describe your stories better, why give it all the color it needs. Your covers are the pride of my brother's library and my own—for we have every issue of your magazines—past and present—filed away. To spread these magazines all down on the floor, presents a rainbow of bright colors and bizarre, weird and sometimes really beautiful drawings. Many of Paul's drawings are weirdly beautiful and help to make your magazines two of the most wonderful on the market. Paul's art is even good in answer to a letter, is going through the storm of criticism that all things that are new go through. It takes the public a long time to get used to a thing, sometimes, as not to fit on old standards, even though it does boast that it is becoming more broad—and more unusual. By the way why not publish Paul's picture so we may see who paints these wonderful covers?

I hope that you will have some interplanetary stories in this magazine. I'm "crazy" to go to distant planets and universes. I hope that you will put out an Air Wonder Quarterly. Keep the same type of stories in Science Wonder Quarterly as you print in your Science Wonder Monthly, and the same with Air Wonder Quarterly. Although I like Air Wonder Stories very much, Science Wonder Stories is my favorite of your two magazines. However, Air Wonder Stories comes a close second. Stick to stories in your magazines, and please cut out those articles, such as "The Problem of Space Flying." While I realize that this is very educating, yet these two magazines are first of all fiction magazines—let them remain so. Your stories all contain a tremendous store of scientific facts that most of us would not otherwise know of unless we were out of school a study. I must say that your magazines has done a great deal to promote an interest in science and we are all the better for reading your magazines, and I'm sure you deserve a great deal of appreciation for this.

"Men With Wings" was delightful. "The Planet's Air Master" was also good. "The Ark of the Covenant" was very fine. In fact I enjoyed all your stories—and I read each and every one. Mr. Repp is one of our favorite authors and we especially enjoyed his "Bottom Dwellers." We surely must have a sequel to that. Could both to you and your magazines Mr. Palmer (Dr. you)? Also I think Dr. Keller's "Human Termites" is simply marvelous and I'm eagerly waiting for the third installment—an installment well worth waiting for. Here's for bigger and better serials.

MARGARET VON LESSING,
Los Angeles, Cal.

(Miss von Lessing's letter is quite a tremendous blow to the "do away with serials" group of readers. She speaks so fervently and with such good sense that her words become very convincing. We can perceive that the battle over the question of serials will soon be over. Miss von Lessing, the Joan of Arc of the "Keep Up the Serials," waves her battle flag in defiance of her opponents. And they seem to be vanquished. We are very, very glad to get her letter.—Editor.)

Short Stories an Insult to Magazine

Editor, AIR WONDER STORIES:

In answer to Mr. Keesling's letter in the October issue of your magazine as long or short serials, I am writing my vote of preference. I prefer the long serials such as "The Ark of the Covenant." The longer the better. If a story has certain good phases it should be very long with interesting details around it. I have every issue of your magazine and I always read "The Reader Airs His Views." Now I have seen more letters asking for long serials than short ones. So, Mr. Editor, that should prove to you that longer serials are wanted the most. Now I have a knock for you. In your October issue there are seven stories. Each of them is very small, excepting "The Ark of the Covenant." "The Sky Maniac" was fair but should be longer for an excellent story like that. The rest of the stories went as high as seven pages, even less, one was four pages. That is an insult to the magazine and should be righted with a real long one next month. I see that you are asking whether our readers would like the magazine of short stories (Air Wonder Stories) or the magazine with three large stories. I for one am for the three long stories idea. I am sure your readers (mostly) would be of the same opinion.

When will the Air Wonder Quarterly be out?

A. FROEMNER,
1684 George St.,
Ridgewood, N. Y.

(As yet we have made no definite plans for a Quarterly. We are looking over the available material and trying to ascertain our readers' views on the question. We invite all those who favor a quarterly to write in to us.—Editor.)

Wants Interplanetary Stories

Editor, AIR WONDER STORIES:

I have just finished reading my October issues of Air Wonder Stories and Science Wonder Stories, and thought I would send you my comments regarding the kind of stories I like. Interplanetary stories are my first choice, then good realistic stories like "The Ark of the Covenant" (but not in several issues; more about that later) and then my next choice is stories of the future times and inventions.

You stated in your magazine that interplanetary stories were not to be included in Air Wonder Stories. Why? Interplanetary stories generally deal with aviation and I think Air Wonder Stories is the proper place for them rather than in Science Wonder Stories.

Now for serials—I do not approve of serials in any magazine. By having to wait month after month, as in "The Ark of the Covenant," a person loses the trend of the story; and as for serials keeping up the circulation of your magazine, I agree with Mr. J. R. Keesling of Connecticut, that it has nothing to do with it. In fact I personally think that your magazine would sell a whole lot better without any serials.

Now about the length of stories to be published, I think about four stories to each issue would be about right. All long stories to be put in your quarterly instead of running them in several form in your monthly magazines.

About the cover—better let well enough off alone. The cover was what led me to investigate the first science fiction magazine I ever read. After having investigated, I immediately bought a copy, and I have been a faithful reader ever since.

HENRY E. DECKER,
[illegible], Pa.

(We are gradually finding ourselves yielding to the persistent demand of readers of Air Wonder Stories for interplanetary stories. The appeal of our readers is based on the idea and we think about with a great deal of justification, that if flight to other planets is not future greatness then what is?

All we are trying to do, as usual, is to ascertain more fully the desires of our readers. And the more vigorous they make their statements of preferences, the more clearly defined will be our knowledge of what to do.—Editor.)

Doesn't Mind Waiting a Month

Editor, AIR WONDER STORIES:

The only comments I have to make come from "The Reader Airs His Views." You ask about serials. Some of the readers seem to have hysterics if they wait a month to finish a story. I don't. I like serials. The longer the better. I like one every issue. Start one when another leaves off. If they are as good as "The Ark of the Covenant" by the by, are to be remembered "Under of the Waves" have there but one disaster or a year the longer the better. Can't you get a sequel to the latter story? I like sequels too, please have as many as possible.

About long stories, have only one, or at most two short stories, and the rest as long as authors can write them.

You ask which of your two new magazines is the better. I think that Science Wonder is a little ahead of the other because it covers a wider ground but Air Wonder is a close second. After all the magazine with the best stories is the better and if the two keep up as good as they have started it will be a tie, for both will be absolutely unbeatable.

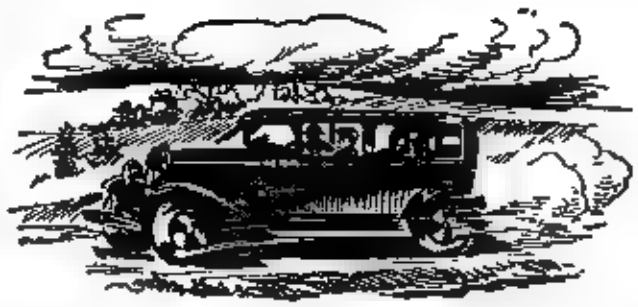
Long on the "Forum and the Questionnaire" in your magazines. Although I have no questions to ask, I enjoy reading them.

And finally, let me horn in on this eternal struggle about the covers. As long as they are as good as this month, or last month, keep them as brilliant, if not more so.

STANLEY THOMAS,
Portland, Me.

(Mr. Thomas is evidently one of those, and there are a great many, who like to pleasurably anticipate the good things to come. We are like that very often. Inasmuch as there are those who will agree and those who will disagree with Mr. Thomas's views, we are trying to please both classes by striking a good balance between serials and complete stories in each issue. We sometimes succeed but [illegible] We always welcome to our columns comments to decide what is the best magazine.—Editor.)

(Continued on page 564.)



Grandfather Walked— Father Motored—

YOU WILL FLY!

If the sound of ROARING motors, or the very thought of racing through the sky makes you "tingle" with joy, then you are among the lucky ones for whom Fame and Fortune await!

The present demand for trained flyers is so overwhelming that a Pilot can easily command a starting salary of $5,000 a year. This is not a mere statement—it is a POSITIVE FACT—and comes from reliable authority.

A time is coming—and it is not far off—when airplanes will be as common as automobiles. Aviation may even surpass the automotive industry, as it has been conclusively proven that the airplane can be depended upon for Safe and Swift transportation.

THIS IS AN AGE OF SPEED!

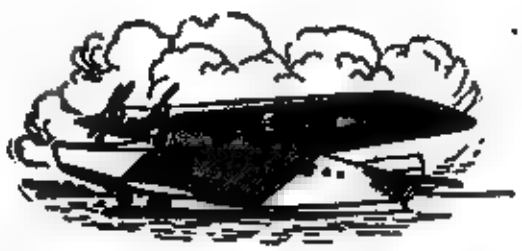
In the near future distance between cities will be measured in terms of HOURS instead of miles. The traveling salesman of today will be the FLYING representative of tomorrow. Companies that now operate fleets of taxi-cabs on the streets will maintain squadrons of taxies for air service.

Railroads, steamship lines, manufacturers, jobbers and practically all industries will rely upon competent pilots, expert mechanics and sturdy planes because they will be able to buy and sell, import and export, bring and deliver their wares QUICKER and cheaper.

These things will soon become realities. Then . . . Pilots and Mechanics will vie for Supremacy!

SKILL WILL COUNT!

The best trained men will lead the field. They will hold the most important and highest-salaried positions in the Aviation industry. Those of lesser qualifications will take their pick of the "leavings," while the Cream of the Crop will go as just rewards to the men who were willing to PREPARE—men who were not afraid to make a sacrifice for the sake of their future—men who will thoroughly understand the HOW and WHY of Aviation!



MODEL OF AMPHIBIAN

This giant Air liner has a 72-foot wing spread, a seating capacity of 12, and is powered by three 300 H.P. motors. It was built by Greer students under the supervision of Govt. Licensed Pilots and Mechanics.

That is why good judgment will tell you to enroll at GREER COLLEGE—because it is a Pioneer and a Leader in the profession of teaching. Because it has been training men for responsible positions *for over 27 years!*

Greer trained men are MASTERS OF THE AIR! The new 1929 Wacos and other planes, as well as the Flying Instructors at the three Greer Airports are licensed by the United States Department of Commerce.

After completing your training at one of these flying fields under the personal supervision of a licensed transport Pilot, you will truly be able to say: "I HAVE WON MY WINGS!"

From then on there will be no limit to your earning power—It will depend entirely upon your own efforts and qualifications!

Send for YOUR copy of the new Greer Aviation book just off the press. Every page contains an interesting story which will take you through the twelve floors of Greer Shops and Laboratories where you will see students actually at work!

Your financial success a year from now depends on what you are TODAY—Begin your career in the world's most fascinating profession NOW . . . while it is uncrowded and beckons with open arms. Thousands of dollars are paid monthly to skilled Pilots and Mechanics —A share is waiting for YOU!

Take advantage of the greatest opportunity of your life—Act Quick—

MAIL THE COUPON AT ONCE!

GREER COLLEGE
Aviation, Division REM 1129
2024 S. Wabash Avenue,
Chicago, Illinois

Without obligation, please send me a copy of your new book "WINNING YOUR WINGS!" I am interested in the training marked below:

- ☐ No. 1. Pilot's Ground Course
- ☐ No. 2. Complete Mechanic's Course
- ☐ No. 3. Private Pilot's Flying
- ☐ No. 4. Limited Commercial Pilot's Flying Course
- ☐ No. 5. Transport Pilot's Flying Course
- ☐ No. 6. Private Pilot Flying Course

Name..... Age.....

Address .....

City..... State.....

Employment service is offered FREE to Greer students. Please state whether you would be interested in a full or part-time position while training. YES ☐ NO ☐

AVIATION FORUM

(Continued from page 561)

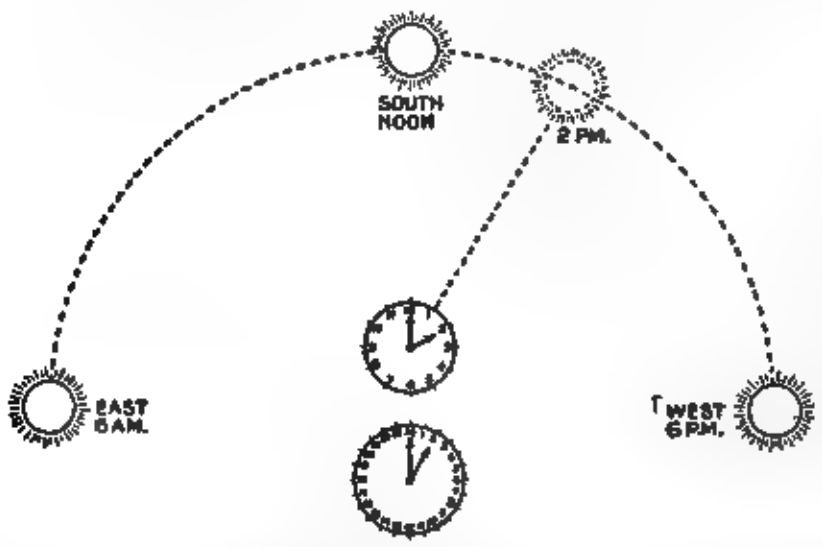
A Watch as a Compass

Editor, Aviation Forum:

I have heard that it is possible to use a watch as a compass. Will you please tell me how it can be done?

JERRY NOONAN,
c/o Apache Inn,
Red Star Ranch, New Mexico.

(In order to use a watch as a compass one must consider the watch as a twenty-four hour astronomical chronometer. In other words, on such a chronometer the hour 24 would correspond to noon and the hour of 12 would be midnight. So, while the hour hand on our watch moves around the face once in 12 hours, that of the astronomical chronometer would move around the face once in 24 hours. This is made clear in the illustration accompanying. Now, suppose our watch registers noon, and we wish to ascertain our directions. If we face the sun, with the hour hand toward the sun, it is pointing approximately south. That will be true also for our watch, for at noon the hour hand on our watch is at the same point on the dial as on a 24-hour chronometer. Again, suppose it is 2 p. m.; our 24-hour chronometer would show the hour hand at 2, or 1/12th of the way around the face. On our watch, however, the same relative position will be only at the figure 1, which is also 1/12th of the distance around the dial, while the hour hand is at 2, which is 1/6th of the way around. While, therefore, on our astronomical chronometer the sun is always in line with the hour hand—when 12 is to the south—on a common watch the sun is only half as far from south as the hour hand indicates. Therefore, a convenient method is to hold the hour hand on the sun, and take south as the point half-way between the hour hand and 12 [this is simpler than holding the sun half-way between the hour hand and 12, but comes to the same thing]. This can be done, of course, only when the sun is visible, and it does not allow for the facts, that *standard* time is sun time only in certain places, and that the sun is exactly south at noon on only four days of the year. For a rough indication, however, it will serve well enough, at most times and places.—*Editor.*)



Illustrating how a watch can be used as a compass. At 2 p. m. if the hour hand of a 24-hour chronometer is pointed toward the sun the number 24 would indicate south. Using a watch with 12 numerals on it the number 1 would be pointed toward the sun at 2 o'clock and 12 would indicate south.

Rocket-Propulsion Engineers

Editor, Aviation Forum:

I have several questions:

1. Just what is a rocket-propulsion engineer? I have for a long time been interested in the rocket experiments going on in Germany. I would like to take this type of work for my life vocation.
2. What schools offer such a course?
3. I believe I understand how liquid oxygen is made, but it is beyond me how they can use it in rockets. Can you help me?

FRANKLIN SMITH,
Box 45, Tower City, Pa.

1. We believe that rocket propulsion has not yet reached the stage where it has become a profession. What the newspapers may refer to as "rocket-propulsion engineers" are engineers who have made the study of rockets their specialty.
2. No schools offer courses in the subject; but Professor R. H. Goddard of Clark University, Worcester, Mass., is the leading American expert on it.
3. You probably understand that oxygen is the portion of the air which serves to "burn" a substance; in the pure form, it brings about a rapid ignition with the release of such tremendous energy that it causes an explosion as with the union of oxygen and hydrogen. The reason for using liquid oxygen is, chiefly, to get the oxygen in a concentrated form; the gas would require too much space, and too much weight for the containers, to be efficient. Furthermore, by having it concentrated, greater explosive power is obtained. The oxygen, in practice, ignites a concentrated fuel, such as benzine or alcohol or a combination of these, and the gases formed rush through the exhausts at a tremendous velocity. The reaction to the force of the exhaust propels the plane forward.—*Editor.*)

PAUL'S COVER ILLUSTRATIONS

THOUSANDS of readers have praised the work of the great artist Paul—and thousands have asked us to sell them the original covers—but not until recently have we been able to satisfy this demand.

Now, reproduction originals in water colors of AIR WONDER STORIES can be had at an astonishingly low price by our readers. *These covers are exactly the same size as the artist's painting* (18" x 25") and made with the same 13 full colors that were used in making the original. There is no printed matter whatever on the cover as you will note by the illustration in the center. Covers are made of heavy flexible mat board that makes them well deserving of a frame — a suitable picture to be hung in any home, classroom or clubhouse.

Young lady holding a full-size reproduction original—which is four times the usual magazine cover size—exactly as it will be mailed to you.

Reproduction Originals in Water Colors

The subjects, while both educational and scientific, may appears fantastic now but in future years will be a reality. Predictions of Jules Verne, H. G. Wells and others that have come true — actual happenings in everyday life.

Surely you will be happy to own one of Paul's full-sized cover illustrations—tell your friends of this opportunity. *Send only one dollar and the reproduction original will be sent to you, postage prepaid.* (Canada and foreign, $1.25.)

$1 *Prepaid*

STELLAR PUB. CORP.
98 Park Place, New York, N. Y.

Science WONDER Stories

A GERNSBACK PUBLICATION

colorful science fiction stories by the world's foremost authors

ENLIGHTENMENT — entertainment —there's a world of it in science fiction, and it's within the grasp of everyone. You will find plenty of both in SCIENCE WONDER STORIES—stories by many of the outstanding writers of scientific literature—authors who have spent years in study to attain literary success in this field. You can share their knowledge of science, and as well, benefit by their contributions to the ever-increasing demand for interesting science fiction literature.

Just read on to the very last line and learn what each issue of SCIENCE WONDER STORIES gives its readers—stories, science test, science questions and answers, reader's forum and book review.

Contents for the December Issue

The Conquerors, by David H. Keller, M.D.
The Lost Martian, by Henry Harbers
The Radiation of the Chinese Vegetable, by C. S. Gleason
The Super Velocitor, by S. C. Carpenter

What Is Your Knowledge of Science?

A short questionnaire based on leading scientific principles related in the current issue—ten questions for you to spend a little time to test your knowledge of the stories you have read.

Science News of the Month

portrays in plain yet concise language every important scientific advance during the month. Nowhere can the average reader get such a wealth of accurate and vital information condensed into such a small volume. Some 42 scientific journals as well as a score of other sources are utilized by our editors in the compilation of this department. The publishers welcome short contributions to these pages from the various scientific laboratories, etc.

Science Questions and Answers

In this interesting feature the editor answers questions sent in by our readers. Read their questions—perhaps the answers will clear up many doubtful issues in your mind, or your own question might be answered in this issue.

The Reader Speaks

Letters come pouring in each day from our readers—some critical, others complimentary —still the most interesting of each are published each month, and answered by the editor.

Book Review

A summary of the leading scientific books of the month with a comment from our editor.

100 Pages
4-Color Cover

On All Newsstands

25c *The Copy*

Mail Coupon

Special Offer!

8 MONTHS FOR $1.00

Canada and foreign $1.25

STELLAR PUBLISHING CORPORATION,
Dept. A-12, 98 Park Place, New York, N. Y.

Enclosed please find $1.00 for which send me the next eight issues of SCIENCE WONDER STORIES.

Name .....

Address .....

City..... State.....

The Greatest Sin of all is usual IGNORANCE of the most important subject in the life of every man and woman—SEX.

Away With False Modesty!

Let us face the facts of sex fearlessly and frankly, sincerely and scientifically. Let us tear the veil of shame and mystery from sex and build the future of the race on a new knowledge of all the facts of sex as they are laid bare in plain, daring but wholesome words, and frank pictures in the huge new library of Sex Knowledge.

"MODERN EUGENICS"

544 Pages of SECRETS

Everything a Married Woman Should Know—

How to hold a husband
How to have perfect children
How to preserve youth
Warding off other women
Keeping yourself attractive
Why husbands tire of wives
Dreadful diseases due to ignorance
Diseases of women
Babies and birth control
Twilight sleep—easy childbirth
How babies are conceived
Diseases of children
Family health guide
Change of life—hygiene
Why children die young
Inherited traits and diseases
What will you tell your growing girl?
The mystery of twins
Hundreds of valuable remedies

Secrets for Men—

Mistakes of early marriage
Secrets of fascination
Joys of perfect mating
How to make women love you
Bringing up healthy children
Fevers and contagious diseases
Accidents and emergencies
Hygiene in the home
Limitation of offspring
The sexual embrace
Warning to young men
Secrets of greater delight
Dangerous diseases
Secrets of sex attraction
Hygienic precautions
Anatomy and physiology
The reproductive organs
What every woman wants
Education of the family
Sex health and prevention

Girls— Don't Marry

before you know all this—

The dangers of petting
How to be a vamp
How to manage the honeymoon
What liberties to allow a lover
Secrets of the wedding night
Beauty diets and baths
Do you know—
How to attract desirable mate
How to manage men
How to know if he loves you
How to acquire bodily grace and beauty
How to beautify face, hands, hair, teeth and feet
How to acquire charm
How to dress attractively
Intimate personal hygiene
How to pick a husband

IMPORTANT!
This work will not be sold to minors.
When ordering your book, state your age!

Corinth Company
245 Greenwich St.
Dept. A W -12
New York, N. Y.

Please send my "Modern Eugenics" SEALED, in plain wrapper. I am sending you $1.98 in accordance with your special half price offer.

My age is .....
Name .....
Address .....
City and State .

THE READER AIRS HIS VIEWS

(Continued from page 563)

As Long as the Author Can Make Them

Editor, AIR WONDER STORIES:

I have read every issue of your magazine with the exception of the July issue. The magazine could not be better.

In the department "The Reader Airs His Views," I read a letter of a certain Mr. John R. Kiessling, of Cincinnati, in which he said that serials should not have more than two parts. I think that he is wrong. If the serials are like "The Ark of the Covenant" they can be as long as the author can make them. Give us more serials like it.

The stories that I liked most were:

1. "The Ark of the Covenant."
2. "The Invisible Raiders."
3. "Around the World in 24 Hours."

"The Air Spy," "The Sky Maniac" and "Through the Air Tunnel" were pretty good. I did not like "The Robot Master."

Before I close I would like to know about the rocket principle in regard to airplanes.

ENRIQUE BLANCO,
San Juan, P. R.

(For the rocket principle with regard to airplanes we refer Mr. Blanco to the December issue of SCIENCE WONDER STORIES and the article entitled, "The Rocket Comes to [redacted] Front Page." Mr. Blanco will find therein a pretty good answer to his question as well as the latest developments on rockets.—*Editor.*)

Wants Book Length Story in Each Issue

Editor, AIR WONDER STORIES:

I have noticed that many of your readers have sent in a list of AIR WONDER STORIES and SCIENCE WONDER STORIES classifying them according to their likes or dislikes. I had this idea and used it for your former publication and am now using it on your present stories though I have never sent them in to you. I have a sort of index made up in one of my note books giving the title of the story, type of story, how I liked it and in what magazine and the issue I can find it in. This I have done for my own information only, as I keep all of your magazines in binders and, when the desire comes to read a good story, by the use of my index I can find at once the type of story which will appeal to my particular mood.

Here is my classification for the first three issues and all of "The Ark of the Covenant" 1 is excellent and it has to be an extraordinary story to get under this class; 2 is very good and will bear rereading time and time again; 3 is good but one reading is about enough; 4 is fair, hardly worth mentioning.

Class 1
"The Ark of the Covenant"
"The Planet's Air Master"

Class 2
"The Silent Destroyer"
"The Yellow Air Peril"
"Beyond Gravity"
"The Bloodless War"
"The Air Terror"
"Flight in 1999"

Class 3
"Men With Wings"
"The Beacon of Airport Seven"
"Islands in the Air"

Class 4
"Where Gravity Ends"

Under the different classes I have also listed the stories in the order as I liked them, such as in class 2 I liked "The Silent Destroyer" the best, though the others are all close to it. Under class 1, I am rather puzzled as it is a tie as to which of these two stories I like best. The first issue of "The Ark of the Covenant" I classed as "Very Good," but as the story went on I decided I just had to class it all as excellent.

Regarding Mr. Kiessling's letter in the October issue I will say that I do not care for long serials and really would prefer, say a book-length or near book-length story in each issue, one long story and one or two shorter stories. Because the only reason most editors have serials is to keep up circulation and so far your magazines have been fine enough to keep a reader without that extra inducement.

And now regarding Edward E. Chappelow's letter in your first QUARTERLY. His suggestion is excellent and I believe you are the logical one to start such a club and have a page or two of your magazines devoted to the club. This could be used to settle main questions and arguments and keep the different clubs informed as to what other clubs were doing (the idea being to have a branch club in each state, or more or less depending on how the idea goes over). I believe it would also be a good idea to have one of your authors at the head of each club if they were in favor of the idea, then we would all be one great big family.

Another reader's idea meets with my approval (I do not remember the name) that of publishing pictures of the editorial staff of your

(Continued on page 567)

Learn Chemistry

Dr. Sloane Will Teach You In Your Own Home

T. O'Conor Sloane, A.M., M.E., LL.D., [redacted]

Chemistry offers those who are ambitious and willing to apply themselves conscientiously the greatest opportunities of any vocation. Industrial firms of all kinds pay tempting salaries to get the right men. No profession offers such opportunities and the next ten years are going to show the greatest development in this science that this country has [redacted]

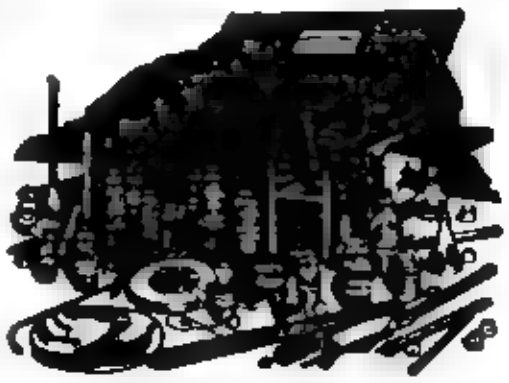
You Can Learn at Home

Our home study course, written by Dr. Sloane himself, is practical and remarkably simple. It is illustrated by so many experiments [redacted] anyone, no matter how little education he may have, can thoroughly understand every lesson. Dr. Sloane will give you individual help besides.

You do not have to have even the small price of the course to start. You can pay for it in small monthly amounts or earn it as many others are doing. The cost is very low, and includes even the Chemistry outfit—there are no extras to buy with our course.

Experimental Equipment Given to Every Student

We give to every student without additional charge the complete chemical equipment illustrated.



Tuition Price Reduced

Besides furnishing the student with his Experimental Equipment, we have been able, through the big increase in our student body, to reduce the cost of the course. Write today for full information and free book, "Opportunities for Chemists."

Mail the Coupon NOW

CHEMICAL INSTITUTE of NEW YORK, Inc.

CHEMICAL INSTITUTE OF NEW YORK, Inc.,
Home Extension Division 12,
96-98-A East 125th Street, New York, N. Y.

Please send me at once, without any obligation on my part, your free Book, "Opportunities for Chemists," and full particulars about the Experimental Equipment given to every student. Also please tell me about your plan of payments and the reduction in the tuition price.

NAME .....
ADDRESS .....
CITY ... STATE... .....
A.W. 12-29

THE READER AIRS HIS VIEWS

(*Continued from page 566*)

magazines with perhaps a short article giving perhaps a few things of interest about them.

One more thing, how about giving the full address of those whose letters get in the readers' department; then we could exchange letters and perhaps help get this club to moving.

CLARENCE R. LIETZ,
1333 Seventh Ave., North,
Fargo, N. D.

(The Science Club is one of those questions that the editorial mind has tucked away. He carries it with him, therefore, and every day he takes it out and examines it. He salts his food, and flavors his drink with it. Our readers must remember that starting a Science Club, at least the kind we have in mind, is a tremendous undertaking. It must be a good one, it must have a tremendous appeal and a fine purpose before we would start it. And we are therefore considering what the nature of such a club might be and its ultimate purpose. Any light that our readers could shed on the question would help toward a solution of it. But the idea is not forgotten.—*Editor.*)

IF you have not as yet seen the SCIENCE WONDER QUARTERLY,

WATCH FOR THE GOLD COVER

Be sure to procure a copy immediately from your newsstand.

This magazine specializes in interplanetarian science fiction and the first issue contains the following marvelous stories:

"The Shot Into Infinity," by Otto Willi Gail
"The Artificial Man," by Clare Winger Harris
"The Hidden World," by Edmond Hamilton
"The Gravitational Deflector," by Harry D. Parker

Do not miss the initial issue now on all newsstands

Neither Better

Editor, AIR WONDER STORIES:

Any one who says that AIR WONDER STORIES is better than SCIENCE WONDER or SCIENCE WONDER is better than AIR WONDER certainly needs a doctor. Any one who sees the two brothers, or sisters, should be able to see they are 100 per cent. better than the best magazine on the market. They are so good they cannot be classed with the best magazines because of being so much better.

Mr. Editor, ask friend Paul to practice drawing human figures.

Will close now as I am anxious to begin on the SCIENCE WONDER QUARTERLY.

Print George Allan England's "Air Trust" and "Flying Legion" some time.

CURTIS TAYLOR,
102 Grove Place,
Utica, N. Y.

(Mr. Taylor makes very definite his definition and stand about our magazines. Such definite expressions of opinion are warmly received at the editorial desk for they enlighten us considerably on the exact nature of our readers' desires. A decision on George Allan England's "Flying Legion" has been made at the same time with this request. The story will be published starting in the January issue.—*Editor.*)

Air Wonder Next Best to Science Wonder

Editor, AIR WONDER STORIES:

AIR WONDER STORIES is certainly a "nifty" magazine; but being a loyal supporter of SCIENCE WONDER STORIES, which I prefer to be my choice, I cannot or will not say that AIR WONDER STORIES is better or equal to SCIENCE WONDER STORIES. The reason for this inequality lies, I am certain, in the difference between the range or scope of the two magazine. AIR WONDER STORIES must content itself with only aviation stories, whereas its sister publication may have stories dealing with many sciences on each of which numerous stories may be written, as you well know. SCIENCE WONDER STORIES, therefore, can never be uninteresting or tame.

AIR WONDER STORIES may be divided into five classes designated by letters. A means

(*Continued on page 568*)

The Best That's in Radio

For The Radio Enthusiast

25c The Copy

ATTENTION!

RADIO-CRAFT — the latest and most up-to-date Radio Magazine. The 100 per cent. radio magazine catering only to the

Service Man
Radio Engineer
Radiotrician
Professional
Radio Experimenter
Radio Dealer
Mechanic

Contents

Some Prescriptions of a Radio Doctor, by Paul L. Welker
The Coast Guard's Best Short-Wave Receiver, by S. R. Winters
The Development of the Modern Sound Reproducer, by Oscar C. Roos

And many other interesting features for the Radio Enthusiast

OUT NOW On All Newsstands

A GERNSBACK PUBLICATION

Or Write Direct

SPECIAL OFFER
EIGHT ISSUES FOR $1.00
Canada and Foreign, $1.25

TECHNI-CRAFT PUBLISHING CORPORATION
98 Park Place (Dept. A.W.S.-1229)
New York, N. Y.

Enclosed find $1.00 for which please enter my subscription to RADIO-CRAFT for eight months. (*Canada and foreign, $1.25.*)

Name .....

Address .....

City and State .....

CHEMISTRY

IF you are interested in chemistry, you will be pleased to hear that a magazine written in plain English, containing a vast amount of information for the beginner and the more advanced student in chemistry is being published now.

Chemical Experimenter

is a Monthly Magazine chock-full of interesting Departments, edited by men who know how to state worthwhile facts.

There are departments about:

"Chemistry in the Home"—"History of Chemistry"—"Experiments in Chemistry"—"Biographies of Celebrated Chemists"—"Chemistry for the Beginner"—etc., etc.

Send the coupon below and you will receive all information about this Magazine.

CHEMICAL INSTITUTE OF NEW YORK, INC.,
19 East 30th Street, New York. A.W.12

Please send me free of charge all information about
Chemical Experimenter

Name .....

Address .....

Town .....

Can You Outguess O. Henry?

Can you look ahead in an O. Henry story and see the unexpected denouement, the strange twists of plot, the breath-taking finish? Try it! If successful you can out-think the cleverest people in the world, for the genius of O. Henry sets the trio of the brilliant people of all lands working at speed—and still he outwits them all! He is the supreme master of the "trick" ending, luring you into sudden laughter while a lump still lingers in your throat—making you jump for a sudden literal flash of horror in the midst of a smoothly flowing tale.

Stories of Wit and Pathos

Quite as O. Henry, but made enough plain in every title and every sentence with the subconscious trend to the ending that—dealing with the light hearted—drawing always from the unplumbed depths of understanding the workings of character—a great human [illegible] and thrilling succession heading [illegible] stories in the direction of a

more thrilling story-teller than you ever knew. His works inestimably enrich the spiritual library and crown the shelves of the most crowded.

52 BEST STORIES

Less than 4 cents each **1.97**

You are now offered for the first time 52 supremely living, emotional stories, handsomely and durably bound in buckram, stamped with gold. No paper, all for the price of only ten ordinary short novels.

Why DO YOU READ? For [illegible] daily drudgery? For an [illegible] thrill? To sharpen your wits or develop your emotions? What [illegible] your reason for reading O. Henry stories is [illegible] in every point.

— — — — — — SEND PRICE COUPON — — — — — —

DOUBLEDAY, DOUBLEDAY, Dept. A.W.-12,
244 Greenwich St., New York, N. Y.

Please send me O. Henry's Best Stories at the special price of $1.97 [illegible] check or M. O. for the amount. (Check which.)

Name .....

Address .....

City and State .....

THE READER AIRS HIS VIEWS

(Continued from page 557)

excellent; B means good; C fair; D passing and F means no good.

Of course, "The Ark of the Covenant" by Victor MacClure is in the A class, as are also "The Silent Destroyer" by Henrik D. Juve, "The Planet's Air Master" by Edward Chapelow, and "The Air Terror" by Lowell Morrow.

Lowell H. Morrow is an especially good writer. I wish you could persuade him to try his hand at a long story for SCIENCE WONDER STORIES.

In class B I included the following: "Islands in the Air" by Lowell Morrow, "The Bonzes of Airport Seven" by Harold F. Sykes, "The Bloodless War" by Dr. Keller, "Beyond Gravity" by Ed Earl Repp, and the "Flight in 1999" by Bob Olsen.

The impression that Harold F. Sykes created in answer to me regarding the character of Dr. Lawson did not reach me at all. I thoroughly sympathized with Dr Lawson who, working as a scientist should, was disturbed and hampered by a company of aliens who build their airport close to his laboratory. Now, who wouldn't get sore? I know I would.

Only one story is in the C class and that is "The Yellow Air Peril" by Earl Vincent.

I placed in class D the rest of the stories that I have not mentioned. These are "Where Gravity Ends" by Robert H. Lunford and "Men With Wings" by Leslie Stone.

There were no stories in the F class, but I felt very much like putting "Men With Wings" in it. This story had more bosh in it than aviation and should have been placed in SCIENCE WONDER STORIES where, I feel sure, it would have received the harsh criticism that it deserved. Well, members will happen, you know.

As a whole, AIR WONDER STORIES is the best science fiction magazine on the market, with the exception of SCIENCE WONDER STORIES. In a year or two the publishers will be more widely known and with such backers as we subscribers are (and we're good advertising agents, too) you cannot fail.

LOUIS KURZEJA,
Chicago, Ill.

(There seems to be quite an interesting controversy arising among our readers regarding which magazine, SCIENCE WONDER STORIES or AIR WONDER STORIES, is the best. We would like to hear from more of our readers regarding their views. As to Mr. Kurzeja's opinion of Dr. Lawson in "The Bonzes of Airport Seven," we might say that Dr. Lawson might justifiably have felt resentment at the intrusion of the airport field near his laboratory. But to deliberately send innocent men to their death to express his resentment is exceeding quite indefinitely the bounds of justification.—*Editor.*)

Quarterly Will Satisfy Readers

Editor, AIR WONDER STORIES:

It was very hard to pick out the best story in the October issue of AIR WONDER STORIES. Finally place the stories as follows:

1. "The Ark of the Covenant" by Victor MacClure.
2. "The Sky Master" by Henrik Dahl Juve.
3. "The Invisible Raiders" by Ed Earl Repp.
4. "Through the Air Tunnel" by Earl Vincent.
5. "The Robot Master" by D. Beckwith.
6. "The Air Spy" by Edward Lee Harrison.
7. "Around the Air in 24 Hours" by E. H. Ramson.
8. "The Reader Airs His Views."

I am for serials. So far your best story has been a serial. Some of your readers don't like the story to be continued to the next issue when they come to an exciting part. I think that this makes the story all the more interesting. I was disappointed in not seeing a new serial start in the same issue that the old one ended in.

I am glad to know that Edmond Hamilton is coming to AIR WONDER STORIES. I consider him among the best of your authors.

If you put out a quarterly even the readers who want just complete stories should be satisfied.

I have a complaint to make on your binding. It's awful. Please use two staples in holding the magazine together.

The illustrations in the October issue were great. Keep up the good work Paul, you're getting better in each issue.

JACK DARROW,
4225 N. Spaulding Ave.,
Chicago, Ill.

(We have not yet decided on the question of an AIR WONDER QUARTERLY. However we may have something interesting to announce in the near future about it.

Mr. Darrow's views on serials are definite enough to make anyone aware of where he stands on the question.

We want to hear here be from "Cities in the Air," Edmond Hamilton's latest offering.—*Editor.*)

Inexhaustible as Man's Imagination

Editor, AIR WONDER STORIES:

After reading the story "The Ark of the Covenant" by Victor MacClure, I will have to admit that you have stumbled upon the best story since the "Second Deluge." The stories mentioned above are the ones that I consider the best.

The most peculiar coincidence possible, I believe, happened in connection with "The Ark of the Covenant." I was wondering why a story like it had never been published that carried the details as far and that well was not having, when along came the "Ark" as if the author had read my thoughts. I got nearly as big a kick out of it as if it had been my own.

The present story that you are publishing, "Cities in the Air," starts out as a fair one, but it has not the emotional details that are necessary for a really good story.

The work you have started is inexhaustible as man's imagination, and I hope you continue the careful selection of your stories to keep the high level you have begun.

I believe that the cover content in SCIENCE WONDER STORIES will prove quite interesting, but I don't quite care for stories as short as they will be. I think the average reading time for a good short story should be between eight to ten minutes.

From a reading of before the time of the "Second Deluge."

ALBERT E. DAWSON,
4010 Greenview Ave., Chicago, Ill.

(Mr. Dawson makes quite an apt statement when he says that our work is as inexhaustible as imagination. We have long ago realized that—that the possibilities inherent in life are as infinite as man's ability to conceive them. For what man conceives, based on natural laws, he will ultimately achieve. In other words, his capacity for achievement is as infinite as time. Our writers are mirroring that capacity of man to achieve. And although many of our authors do not realize the time that is necessary to realize what they picture, still for the most part their productions are prophetic. So we of the early twentieth century may sit back in our chairs and have the centuries of the future [illegible] toward us.—*Editor.*)

No Strangling in Air Pockets

Editor, AIR WONDER STORIES:

I have just finished reading the November issue of AIR WONDER STORIES, and though the stories were not the best I have read, I liked all of them.

Now, about the short stories, the long stories, and the serials. The serials are all right, but there are too many short stories. Most of them I know by heart.

Did I like them? Well, we'll see. "The Air Spy" was good, but short. "Around the World in 24 Hours" needed lengthening; likewise "The Invisible Raiders." "When Space Ripped Open" was too poetic. In the October issue "Through the Air Tunnel" came only after "The Ark of the Covenant. "Cities in the Air" was good but I don't see how it could be possible for the cities to be able to travel so fast even with the new device, for so many buildings would offer resistance to the air.

The "Aviation Forum" is good, keep it up. The "Aviation News" is hopelessly antiquated, so take my advice and discontinue it. If you want to put something good in, give a description of an airplane every month. In the SCIENCE WONDER you offered prizes on the composition, "What Science Fiction Means to Me," so why not have "What Aviation Means to Me" in this magazine? Also why not a suitable aviation design to appear on the cover each month? Some time ago I heard some one say, "What an air pocket was." I think it is a vacuum." I replied. "Well, then, how is it that the aviator can breathe," he came back at me. Well I leave it to you, Mr Editor. How can he breathe? Before I sign off I want to know what happened to the author of "Hick's Inventions With a Kick." I am sure he can write a humorous aviation story. And Edgar Rice Burroughs? And the Quarterly?

DONALD J. SMALL,
New York City.

(An air pocket is not an absolute vacuum where there is no oxygen, but it is an area in which the air pressure is very much reduced. Such an area may be only a half or even a quarter of a mile long, and the aviator may be out of it in a fraction of a minute. The reason why it is dangerous is that the controlling forces on the wings is very much less in that area and the plane very frequently takes an abrupt dip. It presents, however, no particular danger from suffocation.

We accept gratefully the suggestions for additional features for AIR WONDER STORIES [and will give them consideration] Mr. Fenander, the author of "Hick's Inventions With a Kick," is now traveling abroad and is apparently not doing any writing.—*Editor.*)

(Continued on page 569)

THE READER AIRS HIS VIEWS

(*Continued from page* 568)

Omit Romance, Mr. Vincent!

Editor, AIR WONDER STORIES:

Have just finished reading the October issue of AIR WONDER STORIES. I wish you would tell your otherwise excellent author, Harl Vincent, to please omit all the romance of love from his stories.

WALLACE C. WARDNER,
131 S. Washington,
Hobart, Okla.

(We print this request on the behalf of Mr. Wardner. Do our other readers agree with this writer, or do you like the love element that seems to be such an integral part of Mr. Vincent's delightful stories?—*Editor.*)

Professor Younger Speaks

Editor, AIR WONDER STORIES.

With reference to your recent letter soliciting an expression of opinion on the type of stories appearing in AIR WONDER STORIES permit me to quote from your editorial in Volume I, No. 1: "Engineers and pure scientists are too bound by conventions and far too practical and cautious to look far into the future. They do not as a rule risk their reputation by making inspired guesses. Your science-fiction author knows no such restraints. Take Jules Verne for example. His 'Five Weeks in a Balloon,' though deemed impossible at the time it was written, has long ago become an actuality; yet he was bitterly denounced and ridiculed when he first published it. When we read it to-day, it sounds hopelessly tame."

Out of the first four numbers of AIR WONDER STORIES I have read most of the stories appearing and with considerable interest. I also note with interest in the section "The Reader Airs His Views" that your authors, as you point out in the case of Jules Verne, are sometimes "bitterly denounced." Personally, I have no denunciation of the authors or criticisms of the stories to make. I think the magazine is serving a purpose, and doing it well. It is certainly a diversion from the everyday facts and figures to spend an hour or so in the evening letting the imagination run with the authors of AIR WONDER STORIES. Even if I cannot make the "neutralization of gravity" compatible with my little store of information, it is a pleasant diversion to conjecture with the author the possible results.

It appears to be reasonable that this type of magazine with its science stories, as differentiated from magazines dealing with passions and lusts of human beings, deserves the support of the public.

JOHN E. YOUNGER,
Dept. Mechanical Engineering,
University of California.
Associate Editor of AIR WONDER STORIES.

(We feel that Professor Younger speaks for the great majority of broad-minded educators. They realize that constructive, imaginative stories with an educational tone to them promote an intelligent understanding of the world about us. We therefore appreciate the cooperation of men such as Professor Younger.—*Editor.*)

Wants Lessons on Flying

Editor, AIR WONDER STORIES:

On reading the fourth issue of AIR WONDER STORIES I want to say that "The Sky Maniac" was very good and I would like to see more of Mr. Juve's stories about Addison's adventures in the future world. "The Ark of the Covenant" was one of your biggest successes and I would like to see more of such stories in this magazine. "Through the Air Tunnel" was fair. There should be a sequel to "The Robot Master," in which the invention of H. L. Benning is turned over for the benefit of mankind.

I also think that your "Aviation News" and "Aviation Forum" are of interest and of benefit to the readers. You should also do as many other magazines on aviation are doing; that is, put in an account on the principles of flying and lessons in flying each month.

All the stories were interesting so far; so keep up the good work and the AIR WONDER STORIES will rise to great heights.

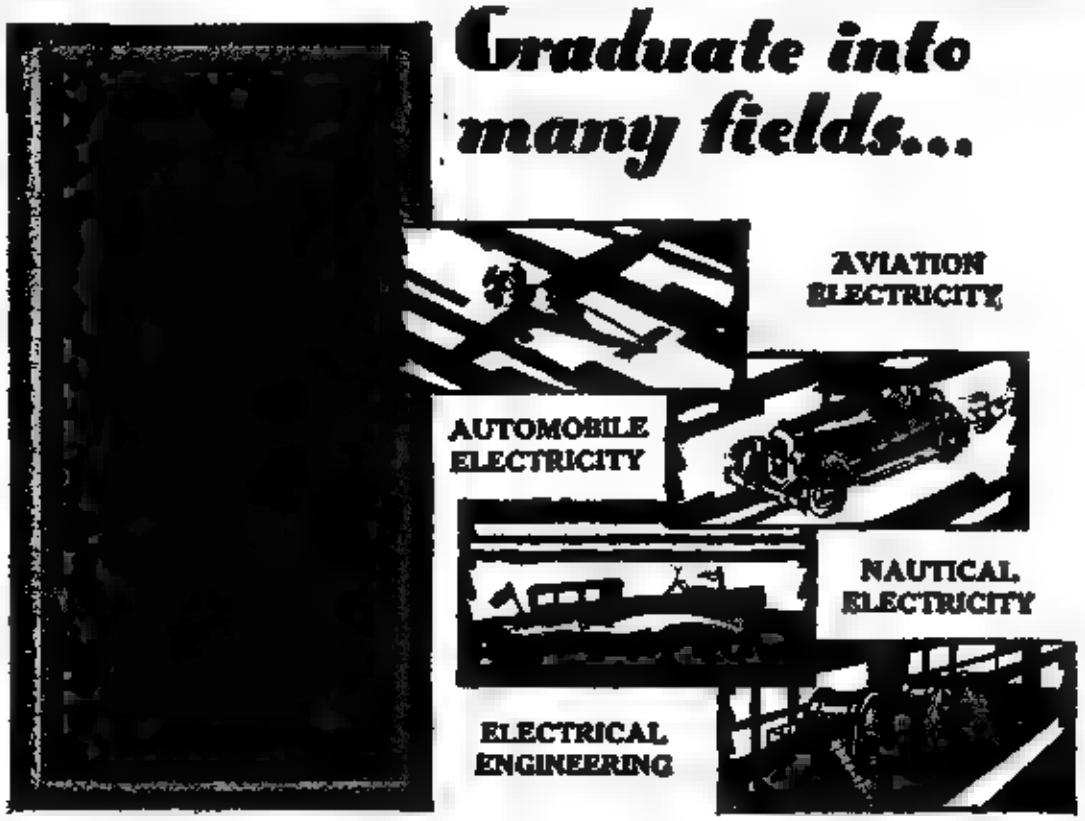
LARRY LEVINE,
West New York, N. J.

(It is a pity that in most of our stories—"The Ark of the Covenant" was a glorious exception—that most of the great inventions of our geniuses are used for selfish and destructive purposes. We personally do not feel that the great minds to-day are bent on attaining a selfish control. For it is usually true that the inventor is not much interested in social affairs, his consuming passion is in creation, and he is perfectly content to allow the affairs of state to rest in the hands of others.

We must be very careful how we expand the features of our magazines. We already have quite a bit of non-fiction material in AIR WONDER STORIES, enough to make a nice balance. We are afraid that we cannot extend the non-fiction content of the magazine at the present.—*Editor.*)

(*Continued on page* 571)

N.Y. ELECTRICAL SCHOOL Men Graduate into many fields...



A full knowledge of electricity, as taught in the New York Electrical School, makes you independent, gives you your choice of either a BIG PAY job with one of the world-famous electrical companies, or a business of your own. ELECTRICITY is also a stepping-stone to Aviation, Automobile Engineering and other highly paid professions.

Here at the New York Electrical School you learn, not by correspondence, but by ACTUAL PRACTICE on full-size standard equipment. NO BOOKS used. Individual instruction—you can start any day. This School owns and occupies two seven-story buildings in New York—the city of most opportunities. It is widely known as the country's oldest and foremost institution for trade training. That's why big companies eagerly demand our graduates.

THE NEW YORK ELECTRICAL SCHOOL
21 West 17th Street, New York

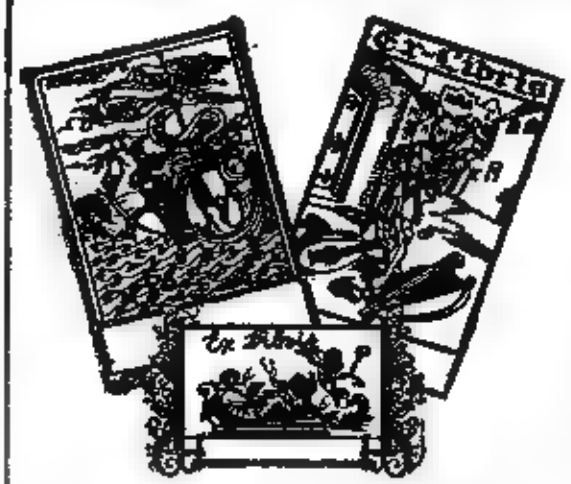
FREE This big [illegible] about the New York Electrical [illegible] your personal use. [illegible]

MAIL TODAY

The New York Electrical School
21 West 17th Street, New York
Please send me FREE your 64-page booklet. It is understood that this request puts me under no obligation.

Name .....

Address .....



Ex Libris Beautiful Bookplates

DO YOU TAKE PRIDE IN YOUR LIBRARY?

A PERSONAL bookplate, with your name on it, insures you against loss of your cherished volumes. The friend who borrows your book can't fail to be reminded that *it belongs to you!*

A bit of the feeling of the great Old Masters is captured for you in our artistic *Duo-Tone Bookplates*, reproducing old woodcuts and engravings, on antique-tint vellum paper. $2 up per hundred, your name imprinted. Send 10c for specimen and illustrated catalogue of our unique new series.

ISKOR PRESS, Inc.
286 Fifth Ave. (Dept. 9) New York

A GERNSBACK PUBLICATION

Science WONDER Quarterly

FOR the first issue of SCIENCE WONDER QUARTERLY, which now may be had on all newsstands, we have secured the American rights of a complete new novel by the famous German science fiction author, Otto Willi Gail.

Far from being fantastic, this story has the very vitals of reality in it. Interplanetary problems become things that are part and parcel of our every-day life. You will be stunned by the truths that this powerful writer gives you. This is one of the most unusual interplanetarian stories ever published. The title of the story is

"THE SHOT INTO INFINITY"

Among the other stories are:

"THE HIDDEN WORLD"
By *Edmond Hamilton*

"THE ARTIFICIAL MAN"
By *Clare Winger Harris*

"THE GRAVITATIONAL DEFLECTOR"
By *Harry D. Parker*

The regular subscription price of SCIENCE WONDER QUARTERLY is $1.75 per year, single copy 50c.

To all charter subscribers, a special rate of $1.25 is available now. (*Canada and foreign* $1.50.)

LARGE MAGAZINE SIZE
9"x12" — 148 PAGES
PURE SCIENCE FICTION

For a Limited Time Only $1.25 For 4 Big Issues or $2.40 For 8 Issues

The Magazine With the Gold Cover

LOOK FOR IT!

ON ALL NEWS-STANDS

50c THE COPY

STELLAR PUBLISHING CORP.,
WS-1229, 98 Park Place,
New York, N. Y.

Enclosed find $1.25 for which please send me the next four issues of SCIENCE WONDER QUARTERLY. (Canada and foreign $1.50.)

Name .....

Address .....

City and State.....

NOTE:—BEFORE YOU FORGET—FILL OUT COUPON NOW ——→

SKINDERVIKEN Transmitter Units

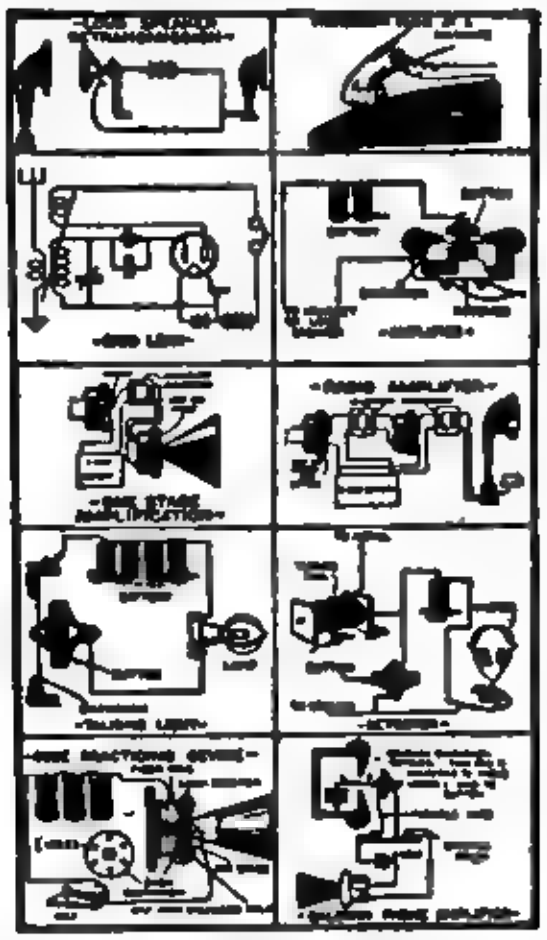
95c

Two for

$1.75

Have hundreds of uses. Every amateur should have two or three of these amplifiers in his laboratory.

A FEW USES FOR THESE UNITS



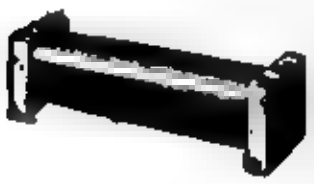
12-PAGE INSTRUCTION BOOKLET

containing suggestions and diagrams for innumerable uses, furnished with each unit.

WE PAY $5.00 IN CASH

for every new use developed for this unit and *accepted and published by us.*

P. G. Microphone Transformer



A Modulated Transformer specially designed for use with the Skinderviken Transmitter Unit. Has many other uses. Primary resistance, ½ ohm, secondary, 55 ohms.

$2

FOR SALE AT LEADING DEALERS
Or Order Direct, Using Coupon Below

SEND NO MONEY

When the postman delivers your order you pay him for whatever you have ordered, plus a few cents postage.

PRESS GUILD, Inc., A 12-29
10-10 A East 16th St., New York, N. Y.

Please mail me at once as many of the following items as I have indicated.

... Skinderviken Transmitter Units at 95c. for 1, $1.75 for 2, $2.50 for 3, $3.25 for 4.
... P. G. Microphone Transformers at $2.

When delivered I will pay the postman the cost of the items specified plus postage.

Name .....

Address .....

City ..... State .....

THE READER AIRS HIS VIEWS

(Continued from page 869)

Combine Rocket and Propeller Planes

Editor, AIR WONDER STORIES:

I love to read Air Wonder Stories. My grandfather 50 years ago told me that if I lived to be 40 years old I would see people flying through the air, and grandfather at the time was over 90 years old. So it can be seen that flying was on the way even at that time.

But before it came, my idea as to how it would be done was that somebody would invent a gravity-shield whereby a man's weight would be nullified, then he could take two palm-leaf fans in his hands and propel himself along, a very simple construction if one but had the gravity-shield.

Nevertheless before it is invented we'll have to fly by some other means, so my idea is to concentrate the rocket plane and the winged plane into one plane. This can be done by inserting the propeller of the winged plane into the hollow tube of the rocket plane. The long hollow tube or tubes would be serving their purpose. The air would be blowing back through them and producing the rocket power. Planes thus constructed would not only be more concentrated which would be of great advantage, but their propellers would be more protected. Besides the propellers would not be blowing back against the planes as they do now, thereby producing work against itself.

A. R. WILKINSON,
Veedersburg, Ind.

(We print this letter for the consideration of our readers. Of course it is difficult to judge of such a device that our correspondent suggests, from the mere detail of an idea. While it is interesting, we are frankly skeptical of its practicability on application. However, something resembling it has been thought of to be used on dirigibles. For example, in the September issue of Air Wonder Stories, Harl Vincent in his "Yellow Air-Peril" mentions a dirigible having a tunnel through the center. A propeller blows air through the tunnel so that a partial vacuum is formed in the front of the vessel. This was also predicted as far back as 1919 by Hugo Gernsback. But between this and what Mr. Wilkinson suggests is a far cry. He would attempt to duplicate with a propeller the explosive effect of exploding gases. We think that as far it can't be done, although it may be scientifically sound. However, as we have said, the idea is interesting.—*Editor.*)

IF you enjoy AIR WONDER STORIES you must read SCIENCE WONDER STORIES, its sister magazine. In SCIENCE WONDER STORIES you will find all of the good authors who write for AIR WONDER STORIES, and there are many stories that deal with aviation and, particularly, space flying and interplanetarian trips. Be sure to get the December issue now on all newsstands. Table of contents follows:

"The Conquerors," by Dr. D. H. Keller

"The Last Martian," by Henry Harbors

"The Radiation of the Chinese Vegetable," by C. S. Gleason

"The Super Velocitor," by S. C. Carpenter

Aviation of the Present Wanted

Editor, AIR WONDER STORIES:

I have just finished reading the November issue of Air Wonder Stories. I am sorry to say that it is the most unsatisfactory issue of that magazine that I have read.

"Cities in the Air" by Edmond Hamilton is very good and I look forward to the concluding chapter next month. "When Space Was Ripped Open" is entirely too fantastic and utterly impossible to make a good story. Mr Wilkins, I am sorry to say, does not appeal to my taste at all, or other, his style does not. "Suitcase Airplanes" was fair, but Mr Skinner stretched thing a little, I think. "Beyond the Aurora" was Mr Repp's poorest attempt at science fiction. His stories that appeared in earlier issues were fine, but it seems to me that he was poor in this one. "The Second Shell"

(Continued on page 873)

See How Easy You Can Get... A Business of Your Own This New Way!

SEND your name and address for an amazing FREE book which gives facts that will surprise you about Modern Photography. It tells of an amazingly easy way to start your own business quickly, with very little capital. It also shows how hundreds of other men and women are making real money in spare time taking pictures.

Many Earn $35 to $90 a Week in Spare Time

In this day of pictures, photographers are making more than ever before. But just ordinary photography is not enough. In this book you are told how such men as Hughes of Kentucky made $97 in two days, how Seger of Pennsylvania earned $700 during spare time in a few months. Our method is so simple and easily grasped that you can make money even while learning.

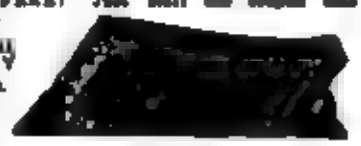
Look into the new opportunities in Photography—and see why newspapers, magazines and photographers outlets use thousands of photos a month, and pay big prices for them. Business firms are constantly in the market for photos to be used in catalogs, booklets and advertising. Portrait work pays big.

FREE Book Tells How

Just mail the coupon for this FREE book. It explains how our thorough Course in Modern Professional Photography enables you to quickly learn this fascinating, profitable work in your own home.

It will pay you to discover the opportunities that exist today in Modern Photography—how you can establish your own business, or make big spare time money, or earn while learning. Scores of invaluable money making ideas—every branch of photography described! And the book is sent absolutely FREE! Just mail the coupon this minute for your copy.

AMERICAN SCHOOL OF PHOTOGRAPHY
3601 Michigan Ave.
Dept. 3607
Chicago, Ill.



AMERICAN SCHOOL OF PHOTOGRAPHY
3601 Michigan Ave., Dept. 3607, Chicago

Please send me free and without obligation my copy of your startling new book, Opportunities in Modern Photography, and full information regarding your course.

Name .....

Address .....

City ..... State .....

NEW SCIENCE FICTION SERIES

Brand New Series

We are presenting to our readers the first six numbers of our new *Science Fiction Stories*. These small books, illustrated by artist Paul, are printed on a good grade of paper and are sold at a low price, due to the large amount put out. New ones will be issued from time to time.

REMEMBER THESE ARE BRAND NEW STORIES AND HAVE NOT BEEN PUBLISHED BEFORE IN ANY MAGAZINE. THEY CAN ONLY BE SECURED THROUGH THE SCIENCE FICTION SERIES.

Every book contains but a single story by a well-known science fiction author. The type is large and well-readable, and the size of each book is 4x6 in., which makes it convenient to carry in your pocket.

Below you will find a list of the first six books. Your choice of five books for 50c or the entire six books for 60c prepaid. Not less than five books sold.

1—THE GIRL FROM MARS
By Jack Williamson and Miles J. [redacted]

Suppose some one from another planet landed on our earth. What would happen? "The Girl from Mars," is an adventure of a Martian visitor, with all the strange situations that one can imagine in such an event.

2—THE THOUGHT PROJECTOR
By David H. Keller, M.D.

The power of suggestion on the human mind forms the basis of "The Thought Projector." Ideas repeated over and over exert a great force on us. They penetrate our minds and give us ideas that we often think are our own.

3—AN ADVENTURE IN VENUS
By R. Macdonnore

Aviation five hundred or a thousand years hence will probably be something beyond most of our present conceptions. Journeys to other planets may well become a commonplace as it does in the present story.

4—WHEN THE SUN WENT OUT
By Leslie Stone

The sun is said to be slowly cooling, and generations many thousands of years hence must face the problem of how their heat and light is to be provided when the sun's end does come. In this thrilling story, Leslie Stone answers that question.

5—THE BRAIN OF THE [redacted]
By Lilith Lorraine

If a super-intelligence could have its wisdom poured into our brains, what a different world we might have. Miss Lorraine poses such a problem and works out the answer in an astounding manner.

6—WHEN THE MOON FELL
By Charles R. Colladay

Collisions between celestial bodies of any size have not occurred within historical times. But such an event is not an impossibility. In fact many astronomers believe that our solar system came into being by such a collision. Suppose the moon were to crash into the earth. What would happen?

STELLAR PUBLISHING CORP.
A W-12, 98 Park Place, New York, N. Y.

Gentlemen:

I am enclosing herewith $_____ for which please send me prepaid books which I have marked with an X

[ ] 1 THE GIRL FROM MARS
[ ] 2 THE THOUGHT PROJECTOR
[ ] 3 AN ADVENTURE IN VENUS
[ ] 4 WHEN THE SUN WENT OUT
[ ] 5 THE BRAIN OF THE PLANET
[ ] 6 WHEN THE MOON FELL

Name _____

Address _____

City _____ State _____

AGENTS WANTED

FREE BOOK. Start little mail order business. Hadwil, 37A-74 Cortlandt Street, New York.

GET OUR FREE SAMPLE CASE—Toilet Articles, Flavorings, Soaps, Specialties. Wonderfully profitable. LaDerma Co., Dept. SC, St. Louis, Mo.

AIRPLANE SUPPLIES

MODEL AEROPLANE Supplies. Write for free bundle of sample stock. Aero Shop, 3050 Hurlbut Ave., Detroit, Mich.

ASTROLOGY

ASTROLOGY—Learn what the Stars predict for 1930. Will you be lucky? Will you win in love? Will your investments prove profitable? Would a change in occupation give you a larger salary? Our Special 15-Page Astrological Reading gives predictions—month by month—with exact days, dates and happenings for 1930 based on your Sign of the Zodiac. Consult it before making any change in home or business affairs, signing papers, love, courtship, marriage, employment, travel, speculation, health, accidents, "lucky days," etc. Send exact birthdate with $1.00 for complete reading. Franklin Publishing Company, 800 North Clark Street, Dept. 208, Chicago.

BUSINESS OPPORTUNITIES

SELL BY MAIL! Books, Novelties, Bargains! Large profits. Particulars FREE! D. Elfco, 525 South Dearborn, Chicago.

CAPITAL—An experienced dependable broker will aid in financing projects of merit. Amster Leonard, East Orange, N. J.

CHEMICALS

BOOKLET OF EXPERIMENTS and chemical catalog 15c. General Chemical Company, Box 397, Reading, Penna.

DETECTIVES

DETECTIVES Earn Big Money. Excellent opportunity. Experience unnecessary. Particulars Free. Write, George Wagner, 3190B Broadway, N. Y.

INSTRUCTION

I CATCH from 45 to 50 foxes in from 4 to 5 weeks' time. Can teach any reader of this magazine how to get them. Write for particulars. W. A. Hadley, Stanstead, Que.

LEARN TATTOOING. Instruction catalog, dime. Miller, X431 Main, Norfolk, Virginia.

LEARN MARBLEIZING Concrete products all kind. Wood, Metals, etc. Resembles polished marble or onyx. Wonderful for garden furniture, table tops, etc. Write Cowell Institute, Grayling, Mich.

MISCELLANEOUS

TOBACCO OR SNUFF HABIT Cured or No Pay. $1.50 if cured. Remedy sent on trial. Superba Co., T28, Baltimore, Md.

OLD MONEY WANTED

$5 TO $500 EACH paid for Old Coins. Keep ALL old money. Many VERY valuable. Get Posted. Send 10 cents for Illustrated Coin Value Book, 4x6. Guaranteed Prices. We buy and sell. COIN EXCHANGE, Room 10, Le Roy, N. Y.

PATENT ATTORNEYS

PATENTS — Time counts in applying for patents. Don't risk delay in protecting your ideas. Send sketch of model for instructions or write for free book, "How to Obtain a Patent" and "Record of Invention" form. No charge for information on how to proceed. Communications strictly confidential. Prompt, careful, efficient service. Clarence A. O'Brien, Registered Patent Attorney, 343-A Security Bank Building (directly across street from Patent Office), Washington, D. C.

PHOTOGRAPHY

12 PRINTS any size 50c. and one on back of pocket mirror FREE. Any size roll developed and 6 good prints 25c. Art Line Photo Service, Altoona, Penna.

SONG POEM WRITERS

SONG POEM WRITERS — "Real" proposition. Hibbeler, D153X, 2104 N. Keystone, Chicago.

STAMPS

STAMPS: 20 Varieties unused free. Postage 2c. Toledo Stamp Co., Toledo, Ohio.

THE READER AIRS HIS VIEWS

(*Continued from page 571*)

was good; how about a sequel to this story and "Cities in the Air?" "The Crystal Ray" would pass on a dark night with a big push, but it certainly would needs lots of push.

The best story you have published so far, with no exceptions, is "The Ark of the Covenant." Really, Mr. MacClure can be ranked now only with Jules Verne, or H. G. Wells. It certainly was a most remarkable story, with a finely interwoven plot, told in a most interesting way, with a wonderful ending. How Mr. MacClure ever wrote such a masterpiece is beyond me. While it may seem a little farfetched now, yet I believe that all the weapons and scientific instruments which he explained with great clarity, will change from probabilities to actual reality in a few years. I am sure that every reader of your magazine wants another story by this author. Try and get one for us, will you?

One criticism for your magazine—it is named AIR WONDER STORIES and you publish only stories of the future. Why not publish some stories of present-day aviation, so that we readers can fully grasp its possibilities and its function, then give us the stories that you do now? You cannot expect readers, the majority of whom, I'll wager, do not understand the workings of the present-day airplane, to understand stories of aviation in the future? Please remedy this fault, and I think you will have the best magazine published to-day.

Your artist, Paul, is certainly a genius. The way he depicts the various stories is wonderful. I know that the reason I bought my first copy of the magazine was because of the illustration on the front. It caught my eye and I picked the magazine up, glanced over it and in a moment I had purchased it. And as for the silly suggestion by some of your readers that the covers are too "loud," why, it's ridiculous. The cover is really the salesman of the magazine. Therefore the cover should be attractive and, by taking away the colored illustration by Paul and substituting a drab-colored affair, I am sure that the sales would fall off.

"Flight in 1999" was good. Bob Olsen ranks among the best of your writers. "The Air Terror" was also very good. More stories by Mr. Morrow would be appreciated. "The Robot Master," though you were tardy in presenting it, far exceeded my expectations. Mr. Beckwith gave us the story that I believe ranks next to "The Ark of the Covenant" in excellence. It tells what we may see developed by man in the way of the robot in coming years. "Around the World in 24 Hours" was humorous, yet it showed us the extent that speed via air may be reached in coming years. "The Air Tunnel," while it was interesting, seemed too fantastic to be sensible and possible. I do not think that the air tunnel as Mr. Vincent speaks of it, will ever be perfected.

Kindly publish this in the section of your magazine called "The Reader Airs His Views," for, as I have criticized you, I feel that others may criticise me and I want them to do so, because I may be wrong and if I am, I want to be corrected.

WATSON RUCH,
Osceola, Pa.

(We are very sorry that the November issue did not meet with Mr. Ruch's approval. Personally, we thought the stories in it were on the average better than in any other issue.

The reason why we have made our stories of the future is that we know that thousands of readers who wanted aviation stories wanted to know—not that man could fly, for we all know that—but they wanted to know the possibilities of the future. Instead of printing bronco-busting or wild-west stories of the air, we are pioneering into the realms of the imagination, and printing stories that are not only thrilling but stimulating as well.

For those who wish to learn the operation of the present-day airplane we have started the "Aviation Forum" in which we will answer any question on aviation. Thus you will get at once not only the present-day operation of planes but als a glimpse into the future.—*Editor.*)

"Aviation Forum" Very Fitting

Editor, AIR WONDER STORIES:

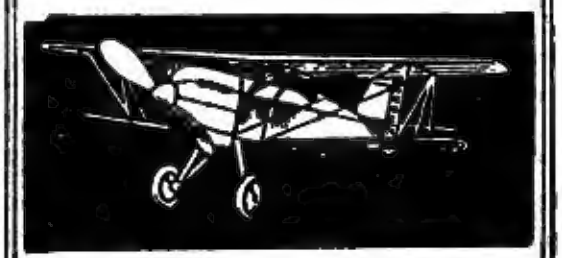
Having been a reader of AIR WONDER STORIES since the first issue, I decided I'd like to state some general opinions about the magazine.

I don't think anyone should kick about the covers because, if anything should sell the magazine and gain for it more popularity, Artist Paul's drawings ought to settle the question. As to the paper, I myself (like a good many others) think that it ought to be a trifle better grade which would not make the magazine so bulky.

The "Aviation Forum" is a decided help and is very fitting for AIR WONDER STORIES. In acceptance to your invitation on views about serials, I think one serial is enough at a time and begin a new one the month after the

(*Continued on page 574*)

2-FOOT CURTISS HAWK



This model has flown over 300 feet. Complete construction set with plan.....$2.50
Blue-prints alone $0.25

2-FOOT FOKKER UNIVERSAL

has flown over 300 feet. Complete construction set with plan.....$2.00

OUTDOOR TWIN PUSHER

Complete kit with plan.....$2.00
Endurance Baby R. O. G. Kit.....$0.50

Booklet 5c., credited on 1st order

HAWTHORNE MODEL AERO. CO.
Dept. AW Hawthorne, N. J.

WHAT is LOVE?

A New, Startling Revelation by a Paramount Authority

LOVE AND MARRIAGE

By WINFIELD SCOTT HALL, M.D., PH.D.

Unfolds the secrets of love and sex relationships fully and frankly. Gives intimate details of such vital subjects as Companionate Marriage and Birth Control. Why muddle along? Learn now about the sex and love instincts, how to select a mate, etc.

Double today to have this new, precious knowledge, if you are a young man or young woman, if engaged or married, if a parent or teacher, or if a man or woman of 45.

CLOTH, 100 PAGES
Only $2.00
We pay postage

JOHN C. WINSTON CO., 72 Wintin Bldg., Philadelphia

SONG WRITERS!

Substantial Advance Royalties are paid on work found acceptable for publication. Anyone wishing to write either the words or music for songs may submit work for free examination and advice. Postage or envelope unnecessary. New demand created by "Talking Pictures", fully described in our free book. Write for it Today—Newcomer Associates
751 Earle Building, New York, N. Y.

SCIENCE FICTION CLASSICS

You will be interested in learning of the new science fiction books which are now being published — just read page 484 for further details.

Get into AVIATION Quickly, You Learn AT HOME

FREE BOOK

Famous World War Flyer now training men to get into Aviation RIGHT! Home Study Course qualifies you in short time for Aviation job paying $100 to $400 monthly. Employment help.

If You Want to FLY—

Amazing new plan offers actual flying instruction, saving hundreds of dollars. Home Study Training fits you for ground job on airport. You pay for tuition out of earnings. Scores of fellows doing it. No experience or education needed. You must be over 18. Write for famous FREE BOOK, which tells all. Be sure and give your age. Major R. L. ROCKWELL, Dayton School of Aviation, Desk G-23, Dayton, O.

Ten Tools in One

A SMALL but handy article which serves for every possible need of the all-round mechanic. Invaluable in any emergency.

An excellent combination of utilities for the household—every necessity featured: HAMMER—KNIFE-SHARPENER—NAIL-PULLER—BOTTLE-OPENER — SCREW - DRIVER — CORK-SCREW — CAN-OPENER — WEIGH-SCALE—RULER—TABLE OF WEIGHTS AND MEASURES. Just glance at the illustration and you will see how really useful this article is. The "Ten in One Tool" is 10 inches high and finely nickel-plated.

The new tool is not only handy in the household, but every TOURIST, AUTOIST, CAMPER, PICNICKER, BOY-SCOUT, FISHERMAN, CANOEIST, etc., should carry in his bag one of these indispensable combination tools. No SHOP, OFFICE, STORE, GARAGE, FARM, BOAT, should be without one. Price $1.00, POSTAGE PAID.

Be the first one to own the "Ten Tools in One" in your town.

Send your order today, pin a dollar bill to coupon below and the shipment will go forward to you the same day as received.

GRENPARK TOOL CO.
245 Greenwich St.
New York

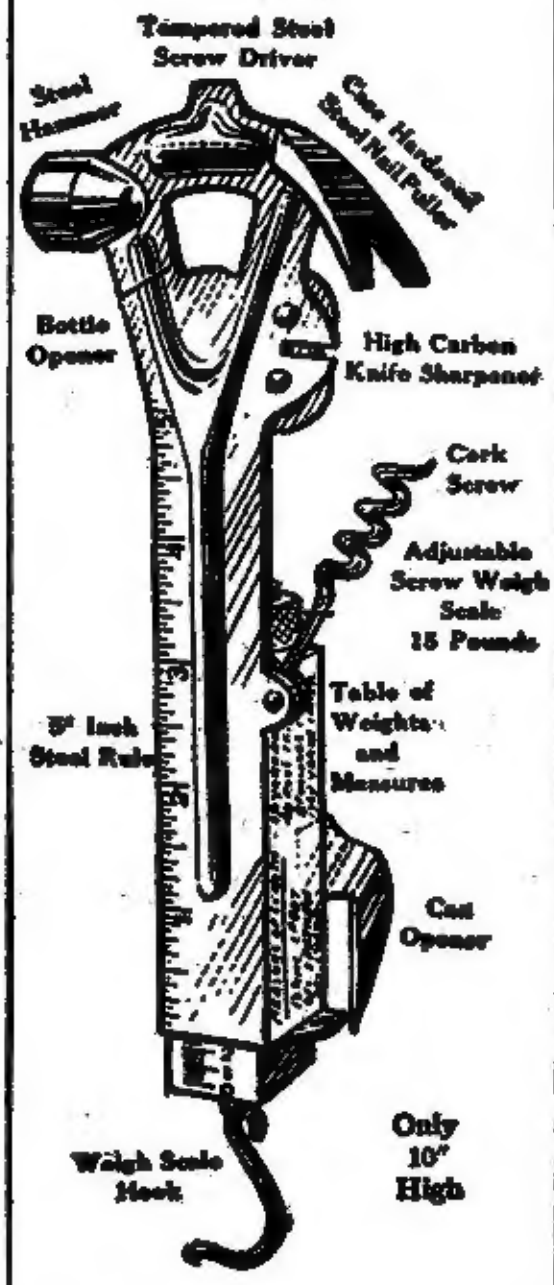
Grenpark Tool Company, A-12
245 Greenwich Street,
New York, N. Y.

Enclosed find $1.00 for which please send me prepaid your "Ten Tools in One."

Name .....

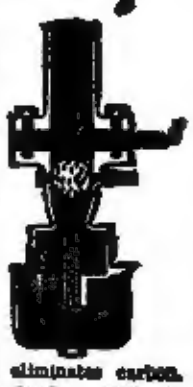
Address .....

Town..... State.....



450 Miles on a Gallon of Gas!

According to a recent article by the president of the world's largest motor research corporation, there is enough energy in a gallon of gasoline if converted 100% in mechanical energy to run a four cylinder car 450 miles.



NEW GAS SAVING INVENTION ASTONISHES CAR OWNERS

A marvelous device, already installed on thousands of cars, has accomplished wonders in utilizing a portion of this waste energy and is producing mileage tests that seem unbelievable. Not only does it save gasoline, but it also creates more power, gives instant starting, quick pick-up, and eliminates carbon.

FREE SAMPLE and $100 a Week

To obtain national distribution quickly, men are being appointed everywhere to help supply the tremendous demand. Free samples furnished to workers. Write today to R. Oliver, Pres., for this free sample and big money making offer.

WHIRLWIND MFG. CO.
939-41 E. Third Street, Milwaukee, Wisc.

To New Readers

A few copies of the July, August, September, October and November issues of AIR WONDER STORIES can still be had at the regular price of 25c each. Send cash, stamps or money order to

AIR WONDER STORIES
98 PARK PLACE NEW YORK

THE READER AIRS HIS VIEWS

(Continued from page 573)

preceding one. Also, two months is long enough to wait for the general run of serials. In regard to your other stories, I think three or four long stories better than five or six short ones, because in the shorter stories your interest is hardly aroused before the finis.

Your best story so far, in all issues, is Victor MacClure's "Ark of the Covenant" and I heartily think nearly everyone will agree with me. I have just finished the last instalment and was delighted at the ending. I hope we shall hear more from Mr. MacClure.

Best wishes to future AIR WONDER STORIES.

DEAN ST. CLAIR MITCHELL,
331 North 11th Street,
Lincoln, Neb.

(Mr. Mitchell represents the "Moderates" in the battle of serials. He stands for serials but those that take no more than two issues. There are many who stand with Mr. Mitchell. But we pose this question to them, suppose we were able to print a corking good or even an unusual story of 100,000 words [we have now such a story in mind]. Printing it in two issues would mean devoting practically all the editorial space to it. That would be unfair to those readers who may not like the story and who wish a greater choice of stories. Should we therefore forego giving our readers the privilege of reading an unusual story because we must confine it to two issues? We are sure our reader when confronted with such an actual case would say, "Print it, regardless of length." —*Editor.*)

"Flight in 1999"—Too Early?

Editor, AIR WONDER STORIES:

I have just finished reading your third number of AIR WONDER STORIES. Bob Olsen's "Flight in 1999" was O.K. The only thing wrong with that story is that its name is not a good one, and I think its date is a bit too early to have such inventions. But don't publish any more stories such as "The Ark of the Covenant," or I will send a brickbat (a big one, too) instead of a subscription for the next eight issues of SCIENCE WONDER STORIES. In the September issue of SCIENCE WONDER STORIES, I noticed somebody suggested about trying to get Edgar Rice Burroughs publish some of his novels. Boy! If you could get Mr. Burroughs to publish one of his "Mars" books, I'll bet everybody would go wild over his story.

JACK CUNNINGHAM,
335 Park Ave.,
Nutley, N. J.

(It is very difficult to state with certainty how quickly our great inventions will come. Mr. Olsen gives us seventy years to bring about the state of affairs that he predicts in "Flight in 1999." If we look back seventy years to 1859 we see a nation in which there was no telephone, radio, automobile, flying machine, electric light. The telegraph was comparatively new. If we survey the wonders that have come to us in the past seventy years, we must indeed look for many more during the next seventy.—*Editor.*)

Make the Quarterly Twice as Big

Editor, AIR WONDER STORIES:

I have just finished reading John R. Kissling's letter in your latest issue.

The only practical way to end serials would be to either make the QUARTERLY twice as big or issue an annual or semi-annual along with it.

If you do not follow the suggestions above please do not start another serial the month you end the old one.

CHARLES RUSH, JR.,
New York City, N. Y.

All Six Stories Fine

Editor, AIR WONDER STORIES:

Have just finished reading the November issue of AIR WONDER STORIES, to which I subscribe, and I must say that all six stories are fine. Your magazine gets better every month. When do we have another story by Victor MacClure, the gentleman who gave us "The Ark of the Covenant?" That was undoubtedly the best story of its kind that I ever read, and I have read some good ones. Now, if the question as to why there were not a few Germans featured in the "Ark" is bothering Mr. Arthur H. Wolter, why doesn't he write MacClure and ask him? I also agree with several of this month's critics about printing your magazine on better paper. The kind you use is entirely too heavy and cumbersome. Also, while I'm writing I want to put in a good word for your cover artist, Paul—he sure is a wonder.

R. E. McDOWELL,
R. R. 3,
Smithville, Mo.

(We are glad that Mr. McDowell liked the November issue.

We appreciate his general sentiments and invite him to write us again when the mood strikes him, letting us know how he likes the progress of the magazine.—*Editor.*)

Easy to Get into this BIG Money Making Work
$60 to $125.00 A WEEK Radio Operator
$8 to $15.00 A DAY Servicing and Repairing Radio Sets
$5000.00 A YEAR AND UP Radio Engineer for Broadcasting Station
$85.00 A Week Installing and Repairing Talking Picture Equipment

GOOD JOBS *Right at Your Finger Tips*

WHEN YOU ARE R.T.I. TRAINED IN

RADIO-TELEVISION ~ *Talking Pictures*

BIG PAY JOBS! SPARE TIME PROFITS! A FINE BUSINESS OF YOUR OWN! They're all open to you and other live wire men who answer the call of RADIO. The fastest growing industry in the world needs more trained men. And now come Television and Talking Movies—the magic sisters of Radio. Will you answer this call? Will you get ready for a big pay job NOW and step into a BIGGER ONE later on? You can do it EASILY now.

R. T. I. Home Training Puts You In This Big Money Field

Radio alone, pays over 200 MILLION DOLLARS a year in wages in Broadcasting, Manufacturing, Sales, Service, Commercial Stations and on board the big sea going ships, and many more men are needed. Television and Talking Movies open up other vast fields of money-making opportunities for ambitious men. Get into this great business that is live, new and up-to-date, where thousands of trained men easily earn $60 to $100 a week—where $10,000 a year jobs are plentiful for men with training plus experience.

Easy To Learn At Home—In Spare Time

Learning Radio the R. T. I. way with F. H. Schnell, the "Ace of Radio" behind you is EASY, INTERESTING, really FUN. Only a few spare hours are needed and lack of education or experience won't bother you a bit. We furnish all necessary testing and working apparatus and start you off on practical work you'll enjoy—you learn to do the jobs that pay real money and which are going begging now for want of competent men to fill them.

Amazingly Quick Results

You want to earn BIG MONEY, and you want some of it QUICK. R. T. I. "Three in One" Home Training—Radio-Television-Talking Movies—will give it to you, because it's easy, practical, and is kept right up-to-date with last minute information. In a few weeks you can be doing actual Radio work, making enough EXTRA MONEY to more than pay for your training. In a few short months you can be all through—ready to step into a good paying job or start a business of your own. A BIG JOB—BIG MONEY—A BIG FUTURE. There is no other business in the world like it.

FRED H. SCHNELL
Chief of R. T. I. Staff

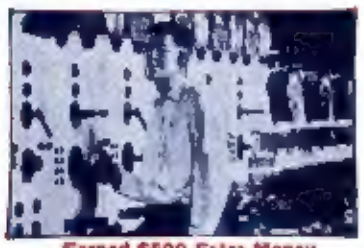
Twenty years of Radio Experience. First to establish two-way amateur communication with Europe. Former Traffic Manager of American Radio Relay League. Lieut. Commander U.S.N.R. Inventor and Designer Radio Apparatus. Consultant Radio Engineer. Now in charge of R. T. I. Radio Training—and you will like his friendly manner of helping you realize your ambition.

Investigate—Send For R. T. I. Book Now

Don't waste a minute. Find out what the great Radio Industry, which has grown faster than the Automobile and Motion Picture business, has to offer you. Find out what other men are earning. SEE HOW EASILY YOU CAN GET STARTED. Get the facts about Radio, Television and the Talking Pictures, first hand, in the big R. T. I. FREE BOOK. Learn what this R. T. I. "Three in One" Home Training can do for you. Mail the Coupon for FREE BOOK NOW.

Radio & Television Institute
Dept. 799
4806 St. Anthony Court, Chicago

R.T.I. Training Brings Big Jobs Like These!



Earned $500 Extra Money in Two Months

Your radio course has enabled me to earn over $500 in two months' spare time work. Understand that this is all spare time work, as I have a permanent position with my father in our store. I give you all the credit for the above and as I said before, I wish to finish the entire course as soon as I can.—Your student, J. NOFFSINGER, Greenville, Ky. R 1, Box 87.

Salary Raised 331-3% Since Enrolling

You may be interested to learn that I am now Radio Service Manager for the H. N. Knight Supply Co. who are distributors for Powermdy Radio Receivers in the state of Oklahoma, and Texas Panhandle, with an increase in salary of about 33 1-3%, since I enrolling with your school.

Thanking you for your interest you have shown in me, and your wonderful course, I am, EARL F. GOSNOOL, 618 East 6th St., Oklahoma City, Okla.

Makes $25 a Day

Haven't forgotten you. How could I when I make as high as $25.00 per day and have made $681.00 in two months from Radio work. That's not so bad when I'm only 15 and in a small town. I just looked over the catalog you sent me before I enrolled, and you did about all you said you would and about as much more.—FLOYD KNISELY, R. F. D. 2, Box 91, St. Joe, Ind.

RADIO & TELEVISION INSTITUTE
Dept. 799, 4806 St. Anthony Court, Chicago

Send me Free and prepaid your BIG BOOK "Tune In On Big Pay" and full details of your three-in-one Home Training (without obligating me in any way).

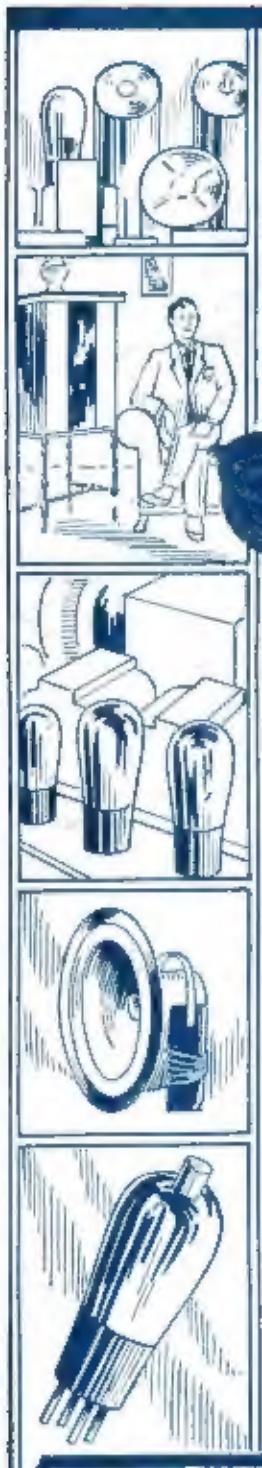
Name.....

Address.....

City.....State.....

$31.50

SCREEN GRID CHASSIS



FREE
Radio Catalog

A POWERFUL super-sensitive A. C. receiver that answers today's demand for the ultra-modern in a high-grade screen grid receiver. It offers everything you look for that is modern in radio. Nothing has been overlooked to secure outstanding quality — advanced engineering features—or efficient performance.

It is establishing a new standard of perfection in radio design. Incorporating such advanced features as screen grid R. F., power detector, "245" push-pull power audio, dynamic tone quality plus practical scientifically shielded construction, it is blazing a new trail in perfection of circuit design. Its super power assures unusual distance range —its ultra-selectivity adapts it for use in the most congested broadcasting districts. Its remarkable tone quality and tremendous volume win for it the instant admiration of the radio purchaser.

Write Today for this new 196-page catalog full of all the latest in radio showing the new, humless, Screen Grid A. C. all-electric and battery operated sets. Beautiful consoles, dynamic speakers, accessories, parts, kits; in fact, everything in radio and all at rock-bottom wholesale prices. Hundreds of real radio bargains from a Radio House backed by over $3,000,000 in resources. This book will save you money. Send for it now before you buy anything more in radio supplies!

Use the Coupon

ALLIED RADIO CORPORATION
711 W. Lake St. Dept. 1-6 Chicago, Ill.

Allied Radio Corporation,
Dept. 1-6
711 W. Lake Street, Chicago, Ill.

Please send me your new 1930—196-page radio catalog—which we understand is to be absolutely free.

Name.....

Address.....

City..... *State*.....